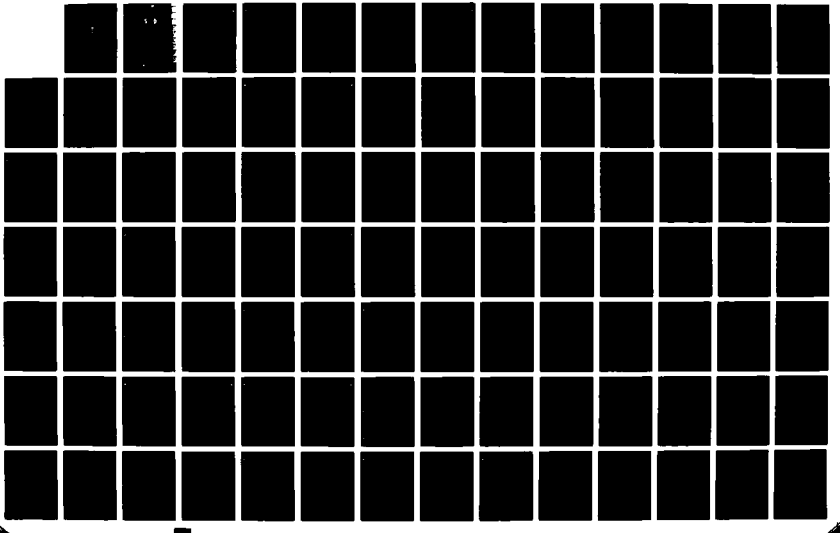
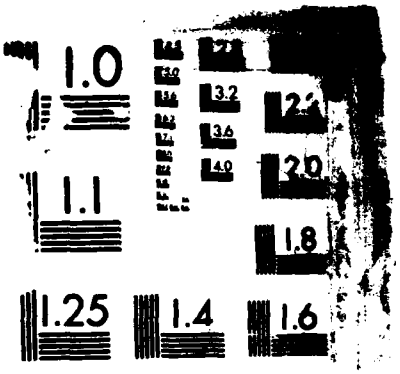
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Program Engineering
and Maintenance Service
Washington, D.C. 20591

Micro PAVER Version 1.0 User's Guide, Airport Pavement Management System

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October 1986

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16. Abstract

Research and development have led to the adaptation and enhancement of mainframe software for pavement management to a form suitable for use on the personal computer. This guide for the application of the computer program, micro-PAVER, explains how the program should be used for storage and retrieval of pavement condition ratings. On the basis of stored data, the program generates reports on repair scheduling, repair prioritization, budgeting and economic analyses, and other management requirements. The program responds to the needs of the airport pavement community and highway authorities. Keywords,

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FOREWORD

This project was funded under Interagency Agreement No. DTFA01-86-2-02040 between the U.S. Department of Transportation/Federal Aviation Administration (FAA) and the U.S. Army Construction Engineering Research Laboratory (USA-CERL). The technical monitor for this project was Aston McLaughlin, FAA. Additional funding was contributed by the U.S. Army and U.S. Air Force.

The assistance of the following individuals from the FAA Micro PAVER User's Group is acknowledged and appreciated: Fred Gammon, Wisconsin Bureau of Aeronautics; Aston McLaughlin, FAA; Mark Arnold, Wisconsin Bureau Aeronautics; Bill Lyon, Nebraska Bureau of Aeronautics; John Auer, Nebraska Bureau of Aeronautics; Roger Barcus, Illinois Bureau of Aeronautics; Diane Hofer, Nebraska Bureau of Aeronautics; Chris Koenig, Nebraska Bureau of Aeronautics; Jim Hall, Indianapolis Airport Authority; Bill Schnerr, Texas Bureau of Aeronautics; Jim Ewing, American Public Works Association; Dick DeFend, Illinois Bureau of Aeronautics; Daniel Meyers, Illinois Department of Transportation; Jim Bildilli, Illinois Bureau of Aeronautics; Bob Benko, FAA; Steve Smith, Port of Seattle; Michael Haney, Quad City Airport; Bob Wurtz, Indianapolis Airport Authority; Michael Kennedy, Wisconsin Department of Transportation; Jim Jensen, Wisconsin Bureau of Aeronautics; Bob Kunkel, Wisconsin Bureau of Aeronautics, and James Hansford, Central Wisconsin Airport.

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The work was performed by the Engineering and Materials (EM) Division, U.S. Army, Construction Engineering Research Laboratory (CERL). Dr. R. Quattrone is Chief of EM.

COL Norman C. Hintz is Commander and Director of CERL, and Dr. L. R. Shaffer is Technical Director.

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WARNING

In order to run Micro PAVER, the hard disk of the personal computer must be properly configured, as detailed in Chapter 2. To ensure that the system has available at least 640K RAM memory, type the MS-DOS command CHK.DSK to receive a disk and memory status report.

Note: The Micro PAVER program and User's Guide will be continuously updated as revisions are made and new features are added.

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Chapter 1

INTRODUCTION

PAVER is a pavement management system which was designed for use by military installations, municipalities, airports, and counties. The system was developed by the U. S. Army Construction Engineering Research Laboratory (USA-CERL) under the auspices of the Office of the Chief of Engineers, U. S. Army Corps of Engineers through funding from the U. S. Army, and U. S. Air Force.

The PAVER system was developed and tested for over ten years and has been implemented by the U. S. Army, Air Force, Navy, and numerous city governments. PAVER has also been adopted by the American Public Works Association as the best available maintenance management system.

Details of the system's development and the results of an economic analysis of its implementation have been documented in CERL Technical Report M-294 and CERL Technical Report M-310.

Micro PAVER is a micro-computer version of the PAVER Pavement Management System. It was developed by USA-CERL under an initial contract from the Federal Aviation Administration (FAA) and follow up funding from the U. S. Army and U. S. Air Force.

Similar to mainframe PAVER, Micro PAVER provides the engineer with data and procedures for practical decision-making to identify cost-effective maintenance and repair needs for roads, streets, parking lots, and airfields.

Micro PAVER provides its users with many important capabilities, including:

* Data storage and retrieval
* Pavement network definition
* Pavement condition rating
* Project prioritization
* Inspection scheduling
* Determination of present and future network condition
* Determination of maintenance and repair (M & R) needs
* Performance of economic analysis
* Budget planning

The objective of this manual is to provide an overview of the Micro PAVER system. The following chapters describe the system's capabilities and provide example reports for each area.

The Parts of Using Micro PAVER

There are four parts of Micro PAVER usage.

First, it is necessary to collect data for Micro PAVER to process. The process for the collection of field data can be obtained by referring to the following manuals: CERL Technical Report M-294 and Army Technical Manual TM5-623 for roads and parking lots and Air Force Regulation 93-5 or FAA Advisory Circular AC:150/5380-6 for airfields.

Second, the collected data must be entered into a Micro PAVER database. Chapter Three of this manual explains data entry and modification.

Third, the generation of reports is the process whereby Micro PAVER organizes the data into a useful form. Reports are the final product of the Micro PAVER process. Chapters Four and Five describe the process of producing reports.

Fourth, the collected data and other information will be stored in a Micro PAVER database. Chapter Six discusses the administration of a database.

Using This Manual

The following conventions are used throughout the manual:

* In examples, user entered data will be enclosed within boxes.
* Most entries must be followed by a carriage return [RETURN]. This will not be shown in the manual.
* Examples will be given when applicable.

Using Micro PAVER

The following conventions are used within the Micro PAVER program:

* The box at the bottom of the screen is used as an information box. Instructions will be noted in that box.
* Any data element that is not specified in the information box as a required field can be skipped.
* The F10 Done key can be used throughout the Micro PAVER program to save data and to move to the end of the current form.
* Pushing the Shift key and Tab key together can be used to move back to the previous input field.
* The Tab key can be used to move forward to the next input field.
* A carriage return [RETURN] is not required if an input field is filled with the maximum number of characters. The cursor will automatically move to the next input field.

* Data entry field size is dictated by the size of the box following the prompt.

* All numerical fields will automatically be right-justified. Alphanumeric fields will automatically be left-justified.

Chapter 2

GETTING READY TO USE MICRO PAVER

This chapter will explain the steps required prior to entering data into the Micro PAVER program. The following topics will be covered:

* Hardware requirements
* Setting up the configuration
* Copying Micro PAVER onto a hard disk
* Accessing the program
* Creating a database
* Explanation of keys (help, function, scrolling)

Hardware Requirements

Micro PAVER was developed for operation on an IBM (IBM is a trademark of International Business Machines) compatible personal computer that runs MS-DOS (MS-DOS is a trademark of MicroSoft). A hard disk drive is required with a recommended 20 megabytes or higher storage capacity. 640K RAM memory is also required.

Setting Up the Configuration

The CONFIG.SYS file should contain the following commands in order for Micro PAVER to run properly:

```
DEVICE=ANSI.SYS

BUFFERS=12

FILES=20
```

If you do not have a CONFIG.SYS file, use an editor to create one containing the above three commands. This file must be placed under the root directory.

The file ANSI.SYS (one of the files that come with DOS) must either be placed under the root directory or the DEVICE=ANSI.SYS command must be changed to include a path to the file. For example, if the ANSI.SYS is kept under the directory \DOS, then the following DEVICE command should be used:

```
DEVICE=\DOS\ANSI.SYS
```

After creating CONFIG.SYS, reboot the system (CTRL-ALT-DEL).

To ensure that the system has available at least 640K RAM memory, type the MS-DOS command CHKDSK to receive a disk and memory status report.

For further explanation concerning CONFIG.SYS and the DEVICE, BUFFERS, and FILES commands, consult a DOS manual.

Copying Micro PAVER onto a Hard Disk

When you receive the Micro PAVER program, it will be stored on several floppy disks. All the files from these disks should be copied onto a hard disk using the procedures detailed in a DOS manual. A summary of these procedures follows:

1) Access the hard disk drive.

2) Create a directory named PAVER for the storage of the Micro PAVER programs.
   Example: C:>md PAVER

3) Access the directory.
   Example: C:>cd PAVER

4) Copy all the files from the disks into the PAVER directory on your hard disk.
   Example: C/PAVER>copy a:*.*

Accessing the Micro PAVER Program

Now that the files have been stored on a hard disk, you are ready to access Micro PAVER. In order to be able to access the programs, you must be in the PAVER directory you created by following the steps outlined in the previous section. The following steps will access the Micro PAVER program:

1) Access the PAVER directory

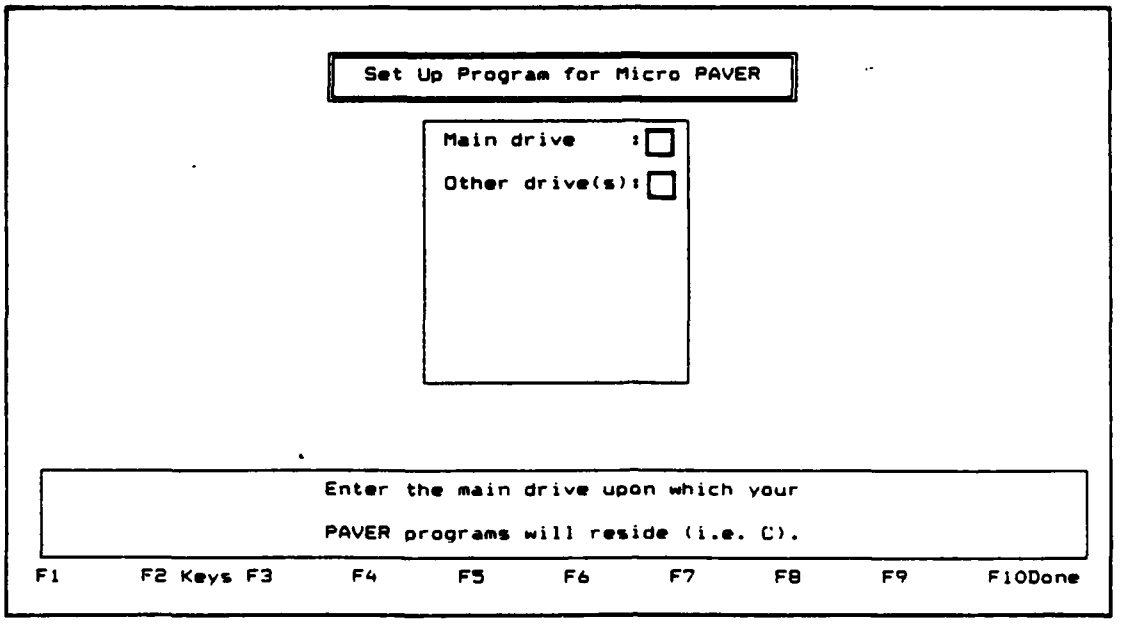
2) Type the word PAVER after the system prompt.

   Example: C:>cd PAVER

            C:>PAVER

You have now accessed the Micro PAVER program.

The first time the Micro PAVER program is accessed, a set up program will appear on your screen.



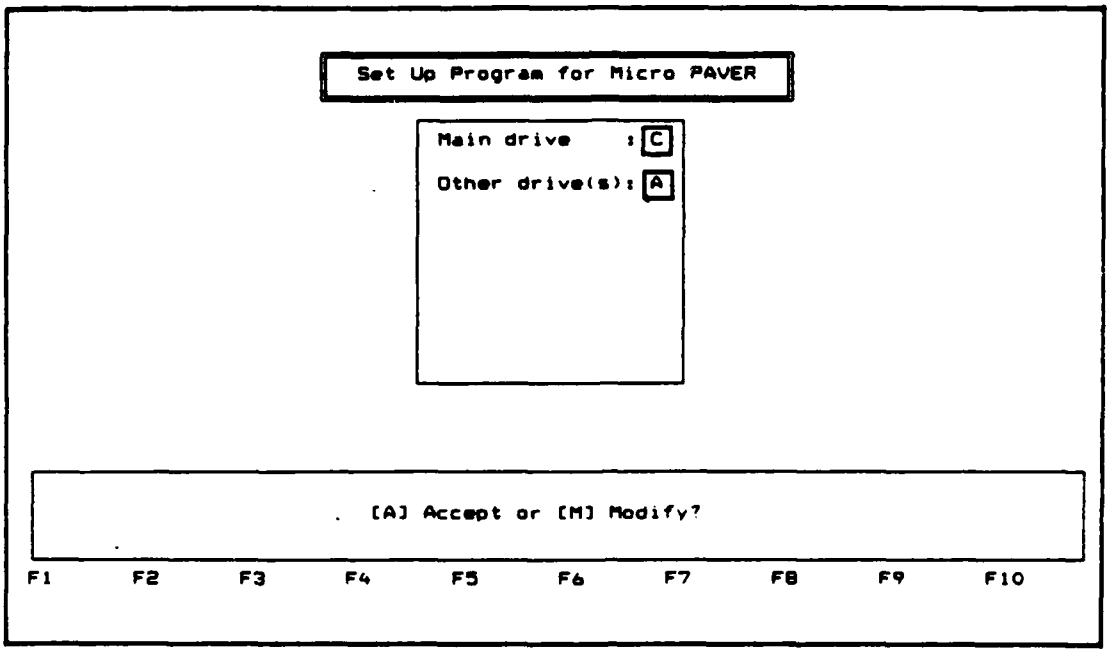
The set up program allows you to assign the names of the drives you will be using for Micro PAVER. First, enter the letter which identifies the main drive (or hard disk drive) where your Micro PAVER programs will reside. Typically, this will be the letter C unless your hard disk is partitioned.

Once the main drive has been identified, enter the drive designation of any other drives you may be using for storing or accessing files. Typical drive designations would be the letters A and/or B. Use the F10 key after all drives have been identified.

You will be asked to [A] Accept or [M] Modify the set up program.

Select: **A** to Accept the record as shown. The Micro PAVER entry screen will appear on your screen.

M to Modify the record. Your previously entered values will be retained until you change them. Use the F10 Done key when you have finished your modifications.

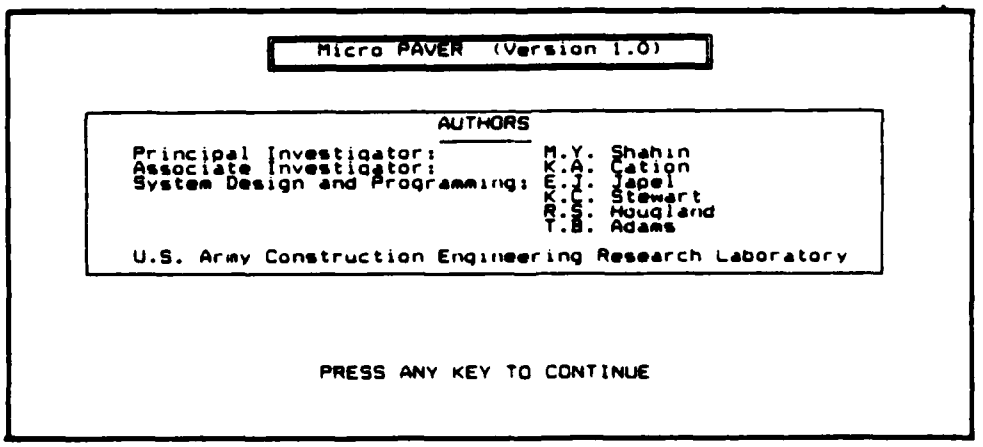


If, at any point in the future your entries need to be changed, access the PAVER directory and type the word SETUP after the system prompt. Follow the same procedures as discussed to modify your entries.

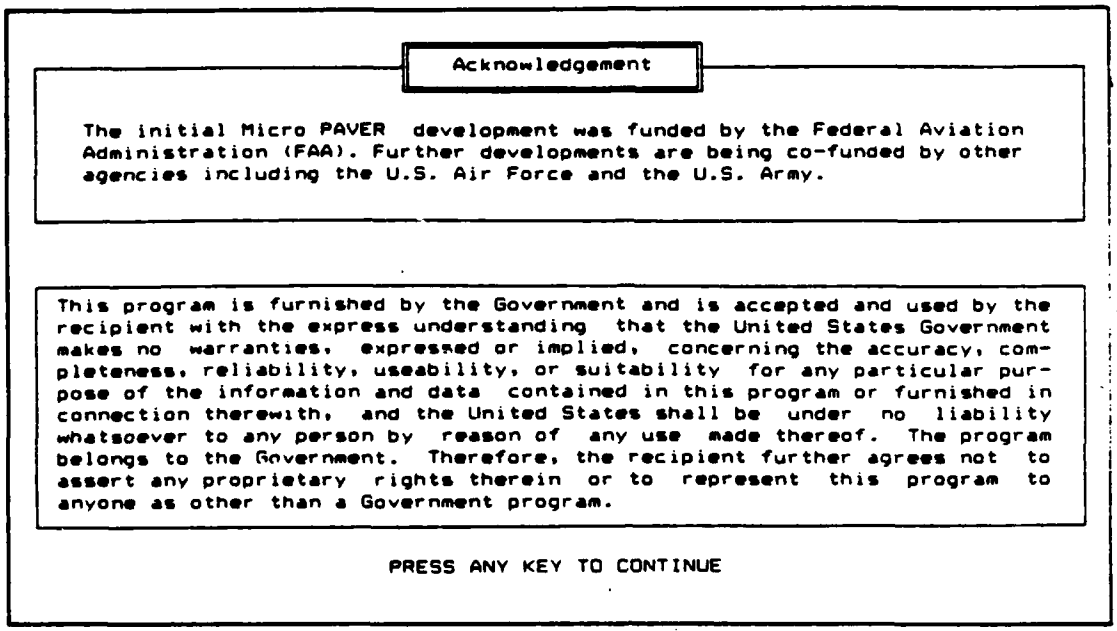
Example: C:>cd PAVER

C:\PAVER>SETUP

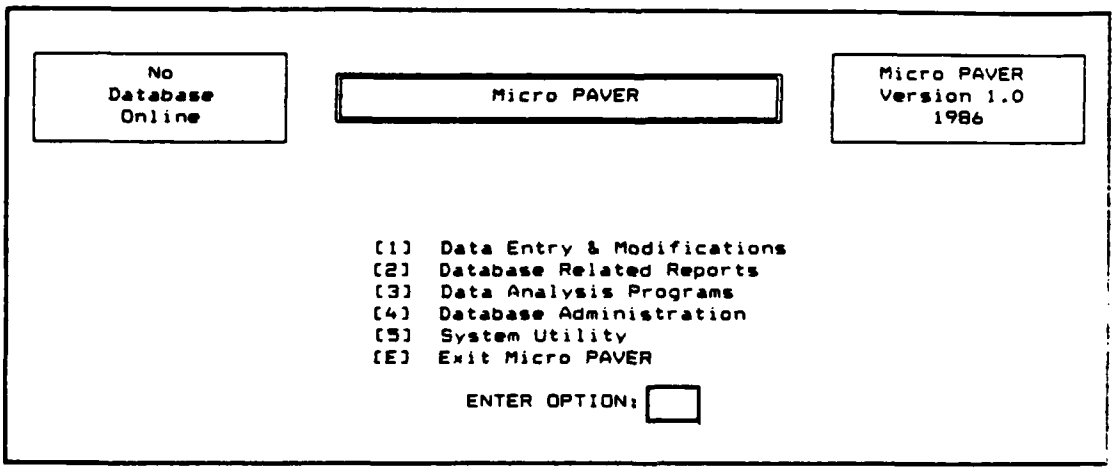
Once the set up program has been completed, the Micro PAVER entry screen will appear on your terminal.



Press any key to continue.



Press any key to access the Micro PAVER main menu.

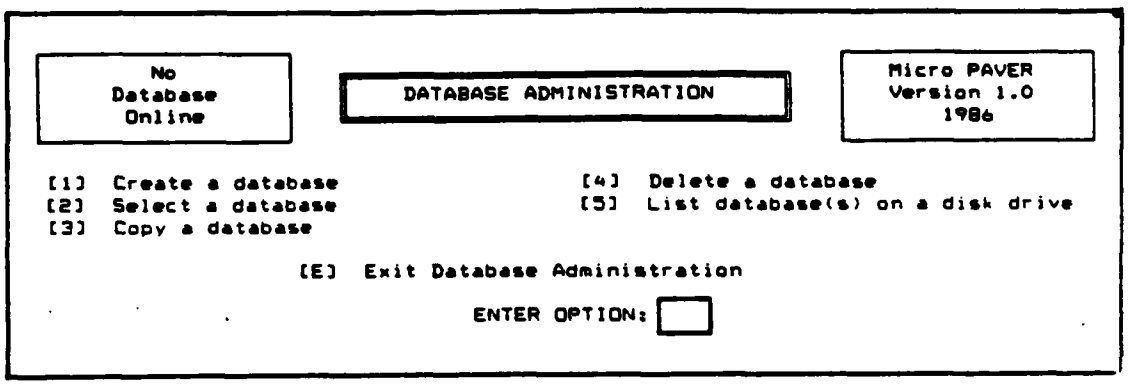


If the program does not work as described, check to be sure that your configuration has been set up as described earlier in this chapter.

Creating A Database

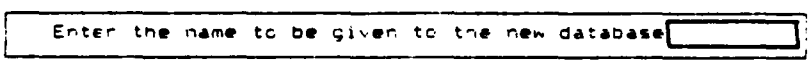
Before you can enter data into Micro PAVER, a database must be created. The purpose of the database is to provide a structured space for storing and retrieving data in a logical fashion.

1) To create a Micro PAVER database, select option 4, Database Administration, from the main menu. The database administration menu will appear on the screen as shown below.

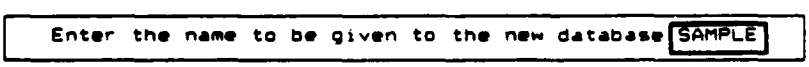


A more in-depth discussion of the options available is presented in Chapter 6. This discussion is only for the purpose of getting you started. Refer to Chapter 6 for more information on the administration of a database.

2) To create the database, select option 1, Create a New Database, from the Database Administration Menu. The following prompt will appear at the bottom of the screen:

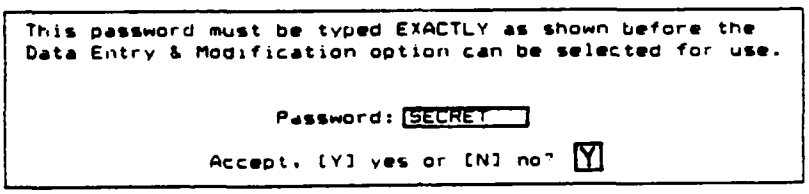


3) Enter up to a seven character, alpha-numeric name which will be used to identify your database.



4) You will now have the option of setting a password for this database. By entering a password, access to your database will be restricted. Each time the database is accessed, the password must be entered exactly as it was entered the first time, including upper and lower case letters. If you do not wish to set a password, enter only a carriage return or tab key. This will take you to the site information table described in Step 6 of this section. To set a password, type a maximum of eight alpha-numeric characters.

WARNING: Once a password is set for a database, do not forget it. It is very difficult to retrieve the password once it has been lost.



5) You will then have the option of accepting or rejecting the password. If you choose not to accept it, no password will be set for the database and you will be shown the site information table described in Step 6 of this section. If you accept the password, the message (PASSWORD ACCEPTED) will appear on your screen. You will then be taken to the site information table shown below.

Agency			
Security		Unit of Measurement	English
Point of Contact	Name: Address: City,State:	Phone: Zip:	

6) The site information table allows you the option of entering information about the database. If you choose not to enter this information at this time, use the F10 function key to skip to the end of the form. Your database will be brought online and you will have the option of exiting the database administration option of Micro PAVER. This is described in Step 7.

If you want to enter site information, the following formats must be followed:

a) Agency - The agency name is the name of the agency managing the pavements. The name may be up to 61 alpha-numeric characters.

b) Security - Any notes pertaining to the security placed on this database may be entered here. This may mean indicating that no security has been set or that a password is required. The description may be up to 23 alpha-numeric characters.

c) Unit of Measurement - Select whether the data will be entered in English or Metric units. The default selection is English. Enter E for English or M for Metric.

d) Name - Enter the name of a point of contact for questions concerning this database. The name may be up to 25 alpha-numeric characters.

e) Phone - Enter the phone number for the point of contact. The number may be up to 21 alpha-numeric characters.

f) Address - Enter the address for the point of contact. The address may be up to 52 alpha-numeric characters.

g) City, State - Enter the city and state for the point of contact. These may be up to 30 alpha-numeric characters.

h) Zip - Enter the zip code for the point of contact. The number may be up to 10 alpha-numeric characters.

Agency	USA-CERL SAMPLE DATABASE		
Security	PASSWORD REQUIRED	Unit of Measurement	English
Point of Contact	Name: KATIE CATION/ EM DIVISION Phone: 217-373-6774 Address: P.O. BOX 4005 City,State: CHAMPAIGN, ILLINOIS Zip: 61820		

7) The database created is now online and data can now be entered. Exit the Database Administration menu and return to the Micro PAVER main menu by selecting option E, Exit Database Administration. This will return you to the Main Menu. Instructions on entering data can be found in Chapter 3.

Explanation of Keys

There are four types of keys available for use throughout Micro PAVER:

* Editing Keys
* Scrolling Keys
* Cursor Movement Keys
* Function Keys

The functions of each type of key are discussed below.

Editing Keys

Editing keys are used for editing fields in an input form. The following keys are used as editing keys:

Key Name	Symbol	Function
Backspace Key		Backspace one space (destructive)

Keys active in alpha-numeric field only:

Delete Key	Del	Deletes the character at the cursor position
Insert Key	Ins	Inserts character(s) at the cursor position (toggles on/off)
Escape Key	Esc	Erases the input field you are working in and returns you to the beginning of the field
Left Arrow Key	←	Backspace (non-destructive)
Right Arrow Key	→	Forward one space (non-destructive)

Scrolling Keys

Scrolling keys are used to position to a particular record or page in a scrolling region (or table). The following keys are used as scrolling keys:

Key Name	Symbol	Function
End Key	End	Displays the last page
Home Key	Home	Displays the first page
Page Down Key	PgDn	Displays the next page
Page Up Key	PgUp	Displays the previous page

Up Arrow Key	↑	Scrolls up through a page
Down Arrow Key	↓	Scrolls down through a page

Cursor Movement Keys

Cursor movement keys are used to move between fields on a particular input form. The following keys are used as cursor movement keys:

Key Name Symbol	Function	
Return Key	[Return]	Moves cursor to next input field
Tab Key	↕	Moves cursor to next input field
Shift & Tab Keys	↑Shift + ↕	Moves cursor to the previous input field

Function Keys

The function keys are identified at the bottom of the screen when they are applicable. Since they will not always be applicable at particular portions of the program, they will not all appear at all times. Only those applicable will appear on the screen. The following function keys have fixed functions in Micro PAVER.

Key Name ID	Function	
F1	Help	Provides help relative to the field you are working in
F2	Keys	Presents a summary of key functions
F3	Add	Allows you to add information to current form
F4	Delete	Allows you to delete information from the current form
F5	Edit	Allows you to edit material in the current form
F6	Find	Allows you to find specific information relative to the current form
F7	Store	Allows you to store inspection results to a file.
F8	Copy	Allows you to copy specific information from one branch or section to another
F9	Next	Skips the current field or moves to the next selected field
F10	Done	Saves your data and takes you to the end of the current form

Chapter 3

DATA ENTRY AND MODIFICATION

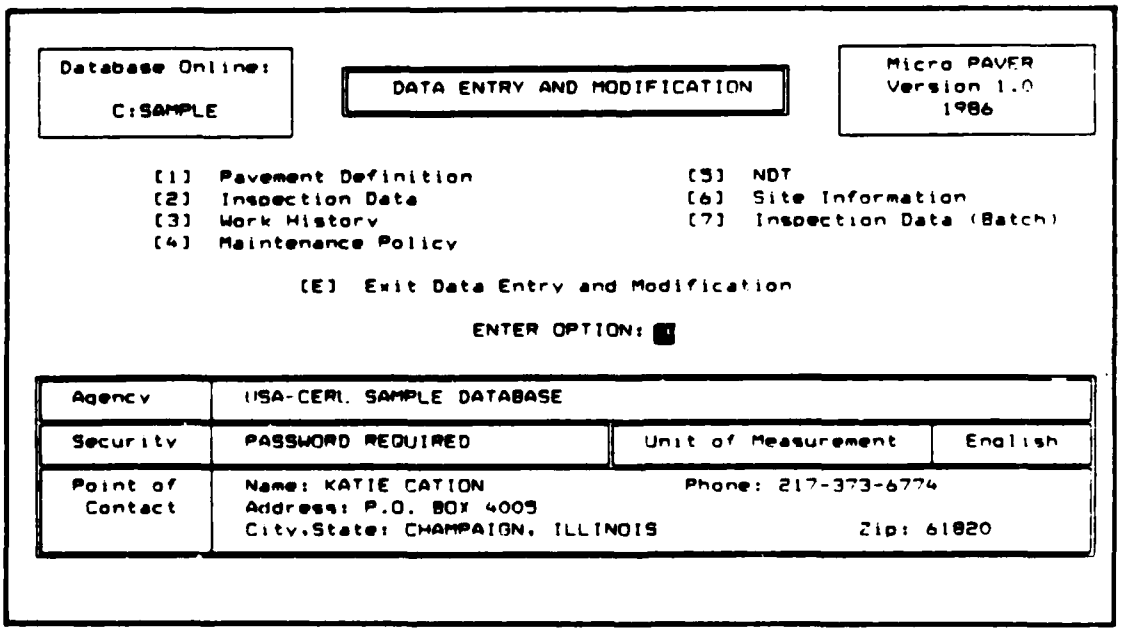
This chapter will explain the procedures for entering and modifying data into a database. The following option forms will be discussed:

* Pavement Definition
* Inspection Data
* Work History
* Maintenance Policy
* NDT
* Site Information
* Inspection Data (Batch)
* Change Key Fields

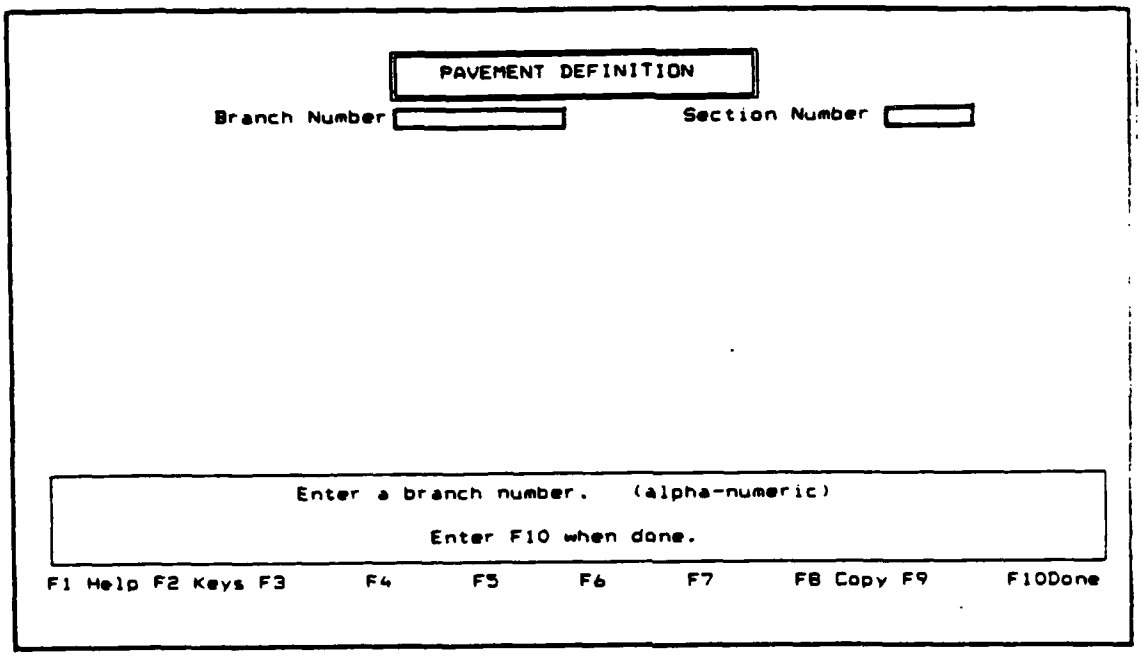
Data Entry and Modification is accessed by selecting option 1 from the main menu.

Pavement Definition

Before any other types of data can be entered into a database, the pavement network must be defined. The pavement definition option allows you to define your branch and section by providing information such as branch name and area, number of sections, and surface type. To access the pavement definition option, select option 1, Pavement Definition, from the Data Entry and Modification Menu.



The following prompts will appear on your screen.



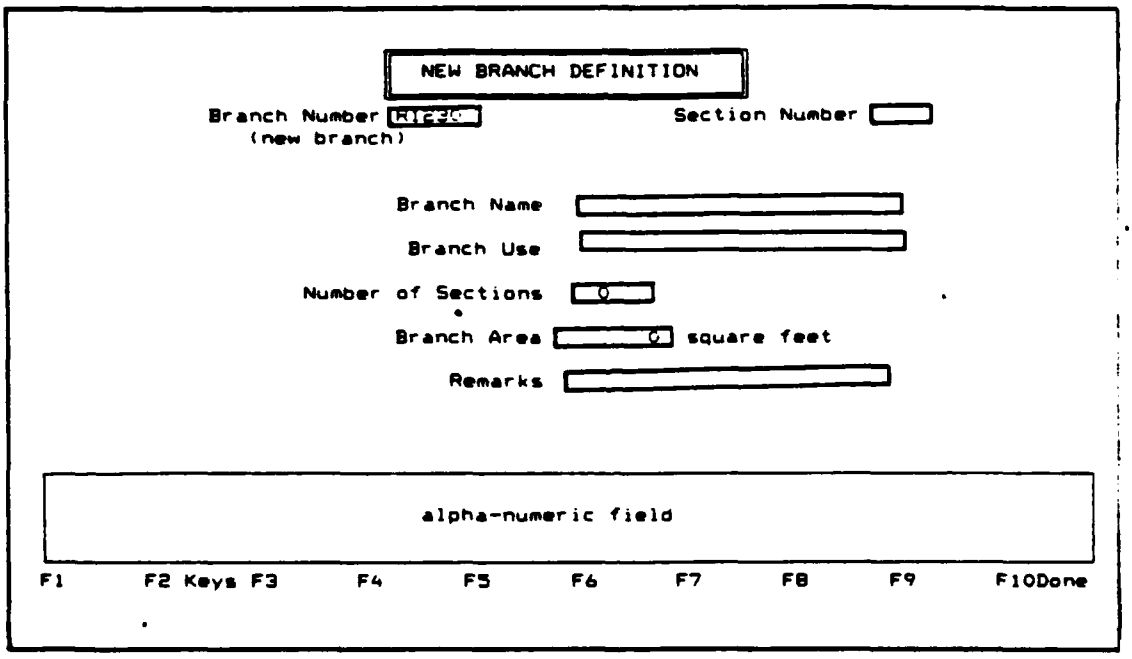
Different information will be requested from you depending on whether you are entering new information, copying existing branch or section information, or modifying existing data. All cases will be discussed in this section.

Entering a New Branch

When the pavement definition screen appears, enter the following information:

1) Branch Number - The branch number can be a maximum of five alpha-numeric characters which identify the branch.

If a new branch number is entered, the following screen appears:



Continue entering data according to the following formats:

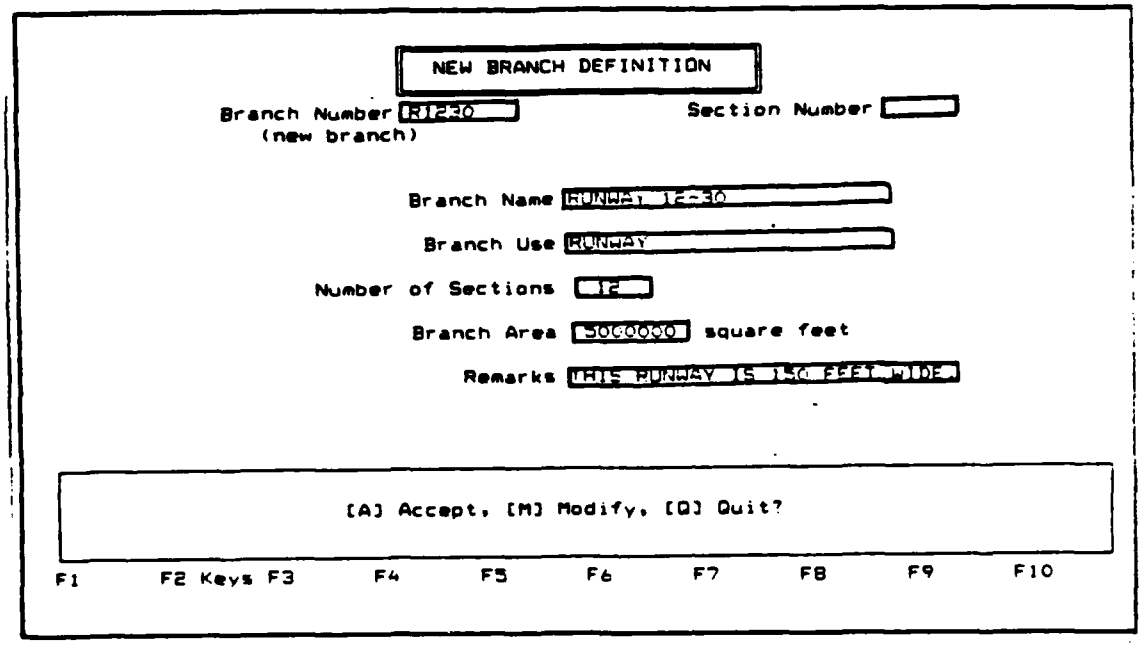
2) Branch Name - The branch name may be up to 25 alpha-numeric characters.

3) Branch Use - This is a required field. Valid entries are APRON, HELIPAD, OTHER, PARKING, ROADWAY, RUNWAY, and TAXIWAY.

4) Number of Sections - Enter up to 4 integers identifying the number of sections contained in this branch.

5) Branch Area - Enter the area of this particular branch in square feet. The number must be less than 8 integers.

6) Remarks - You may enter two rows of up to 35 alpha-numeric characters.



After completing the new branch definition form, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit pavement definition.

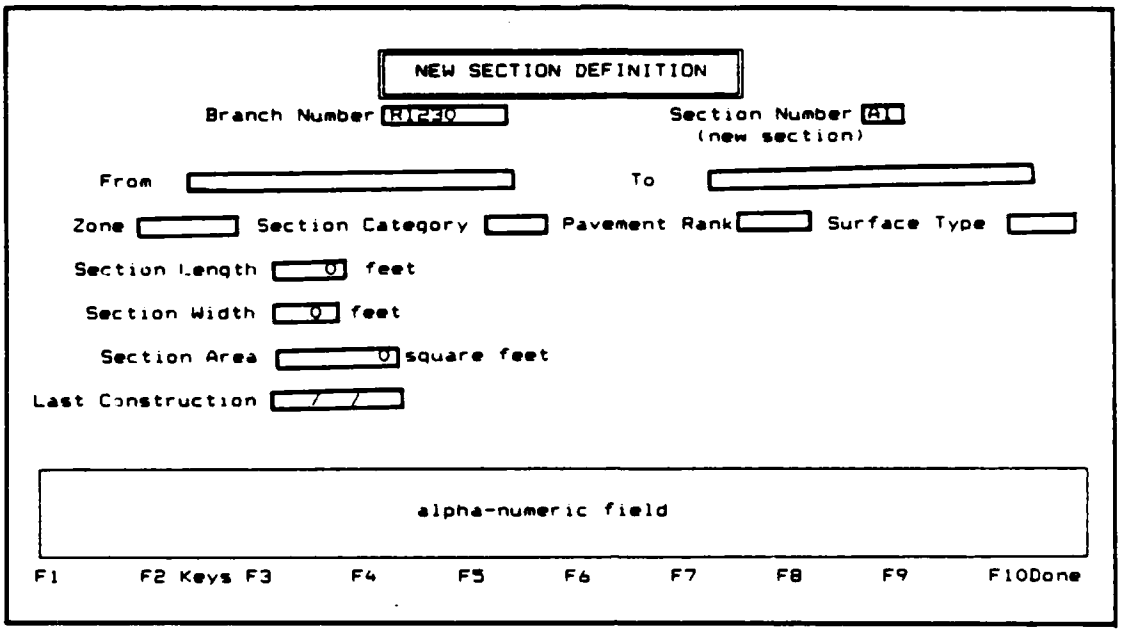
Select: **A** to Accept the record as shown. You will then be prompted to enter a section number for section definition. You may either enter a maximum of 3 alpha-numeric characters which will be used to identify a new section as described under "Entering a New Section" or copy information from a previously defined section as described under "Copying Section Information".

M to Modify the record. You will be allowed to move through the record in order to change any incorrect information.

Q to Quit and discard pavement definition. Your record will be discarded and you will be returned to the Data Entry and Modification menu.

Entering a New Section

If a new section number is entered, the following screen appears:



Continue entering data according to the following formats:

2) From - This may be a description of up to 25 alpha-numeric characters which identifies the location of the beginning of the section.

3) To - This may be a description of up to 25 alpha-numeric characters which identifies the location of the end of the section.

4) Zone - The zone may be up to 4 alpha-numeric characters which identify any zone the section may belong to. Zones may define such things as funding sources or maintenance zones.

5) Section Category - The section category is a letter which the agency may choose to represent different categories. Valid entries are: A, B, C, D, E, F, G, I, J, K, N, Y.

6) Pavement Rank - This is a required field. Valid entries are: A, B, C, D, E, N, P, S, T, X. (P = Primary, S = Secondary, T = Tertiary, X = Other)

7) Surface Type - This is a required field. Valid surface types are:

AAC (asphalt overlay over asphalt concrete)

ABR (asphalt over brick)

AC (asphalt concrete)

APC (asphalt overlay over portland cement concrete)

BR (brick)

GR (gravel)

PCC (portland cement concrete)

ST (surface treatment)

X (other)

Note: If PCC is selected as the surface type, four additional prompts will appear on the screen: Slab Length, Slab Width, Number of Slabs, and Joint Length. These will be discussed later in this section.

8) Section Length - Enter the length of the section in feet (meters). Section length can be a maximum of 4 integers.

9) Section Width - Enter the width of the section in feet (meters). Section width can be a maximum of 4 integers.

10) Section Area - If the section length and width have been entered, the section area in square feet (square meters) is automatically calculated. If section length and width information has not been entered, or the actual section area is different than the calculated area, up to 9 integers may be entered.

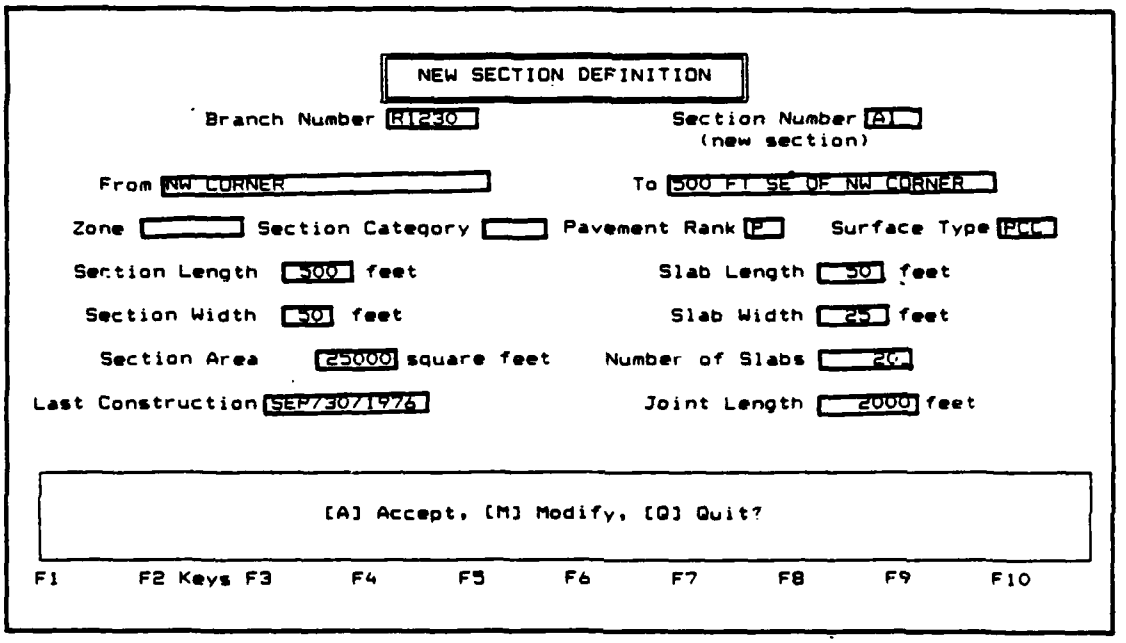
11) Last Construction - Enter the last date that major M & R was applied to the section (M & R work that would bring the PCI up to 100). The date must be entered in date format: MMM/DD/YYY (for example, APR/25/1985 or APR/25/86).

12) Slab Length - This is a required field. Enter the length of a slab in feet (meters). Slab length may be a maximum of 4 numbers. Decimal values are allowed.

13) Slab Width - This is a required field. Enter the width of a slab in feet (meters). Slab width may be a maximum of 4 real numbers. Decimal values are allowed.

14) Number of Slabs - This is a required field. If the slab length and width have been entered, the number of slabs in the section is automatically calculated. If slab length and width information has not been entered, or the actual number of slabs is different than the calculated number, up to 6 integers may be entered.

15) Joint Length - This is a required field. If the slab length and width have been entered, the joint length in feet (meters) is automatically calculated. If slab length and width information has not been entered, or the actual joint length is different than the calculated number, up to 7 integers may be entered.



After completing the new section definition form, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit pavement definition:

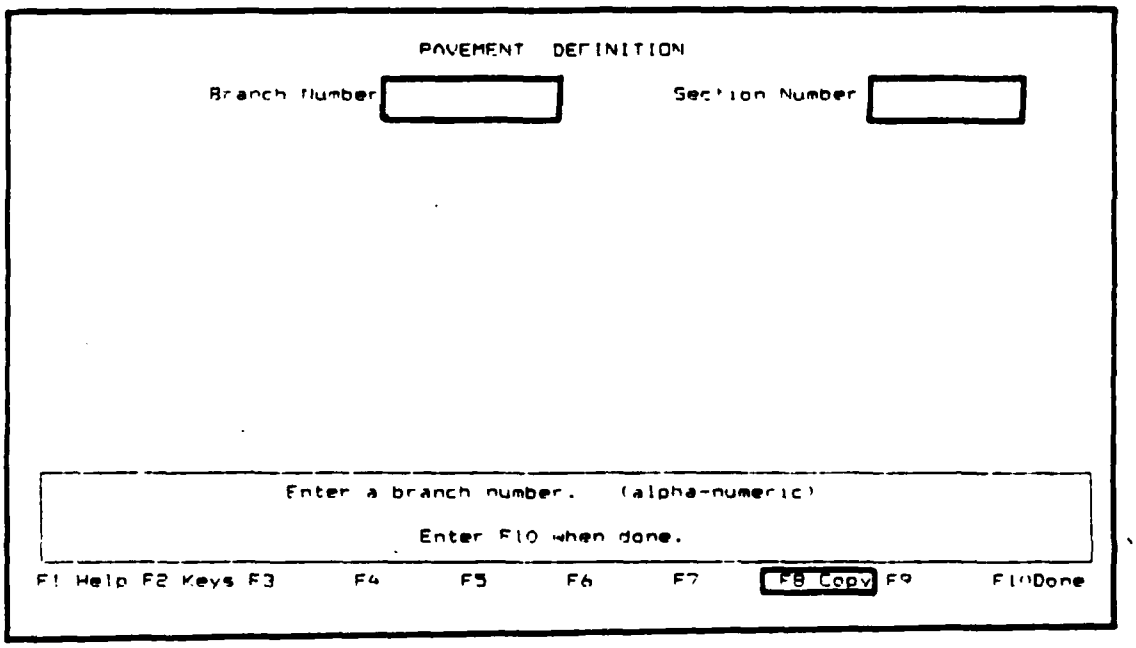
Select: **A** to Accept the record as shown, you will then be prompted to define another section for the same branch. Use the F10 Done key if you do not want to define another section. You will be taken to the Data Entry and Modification menu.

M to Modify the record. You will be allowed to move through the record so you can change any incorrect information.

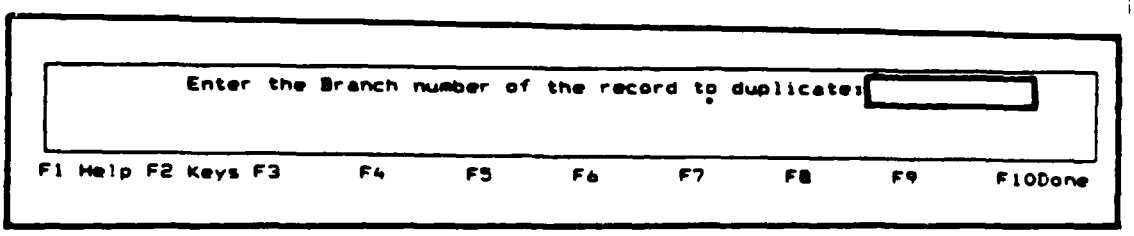
Q to Quit Pavement Definition. Your record will be discarded and you will be prompted to define another section for the same branch. Use the F10 Done key if you do not want to define another section. You will be taken to the Data Entry and Modification menu.

Copying Branch Information

Another option that may be utilized when defining a new branch is the Copy Function, F8. To copy branch definition information from an existing branch to a new branch, press F8 on the first screen displayed in the pavement definition section, as shown below.

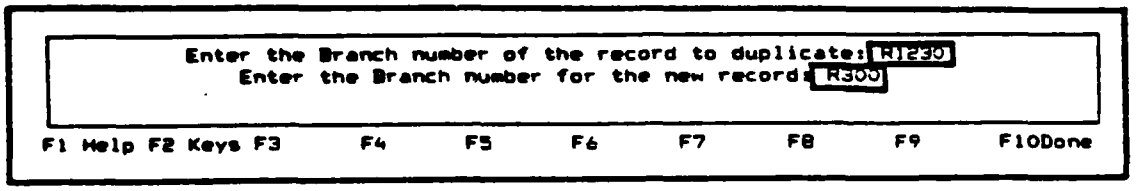


After F8 has been selected, you will be asked to input the branch number of the record you wish to duplicate.

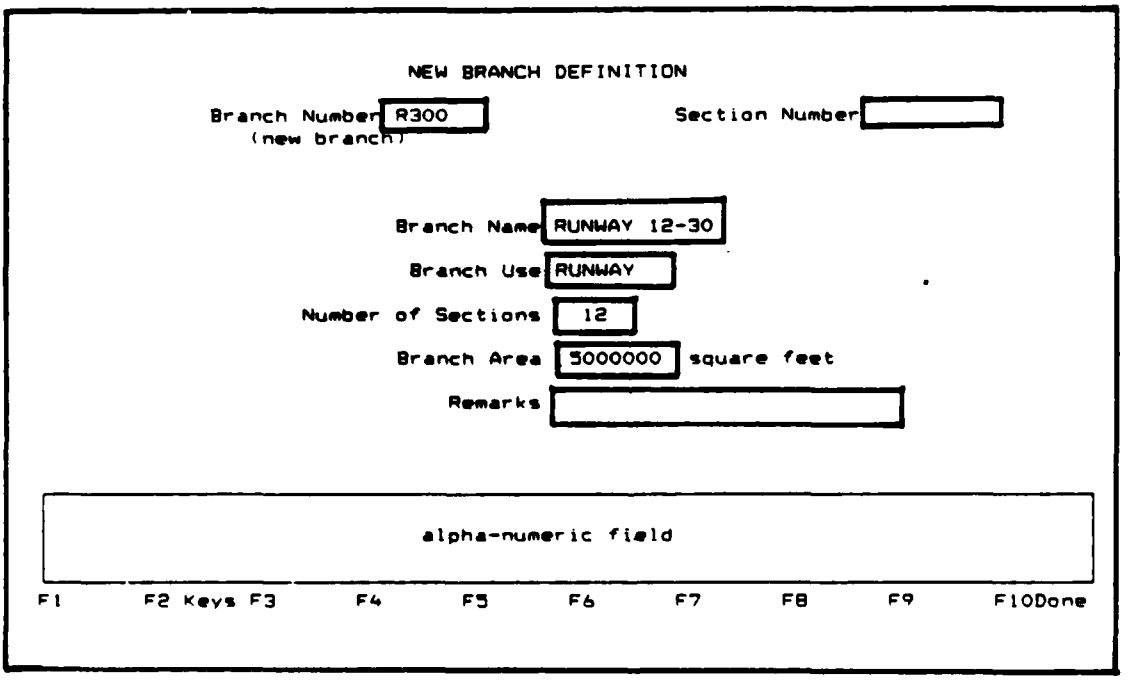


By pressing the F1 Help key, a list of the branch numbers available in the current database will be displayed.

The branch number for the new record must be input now.



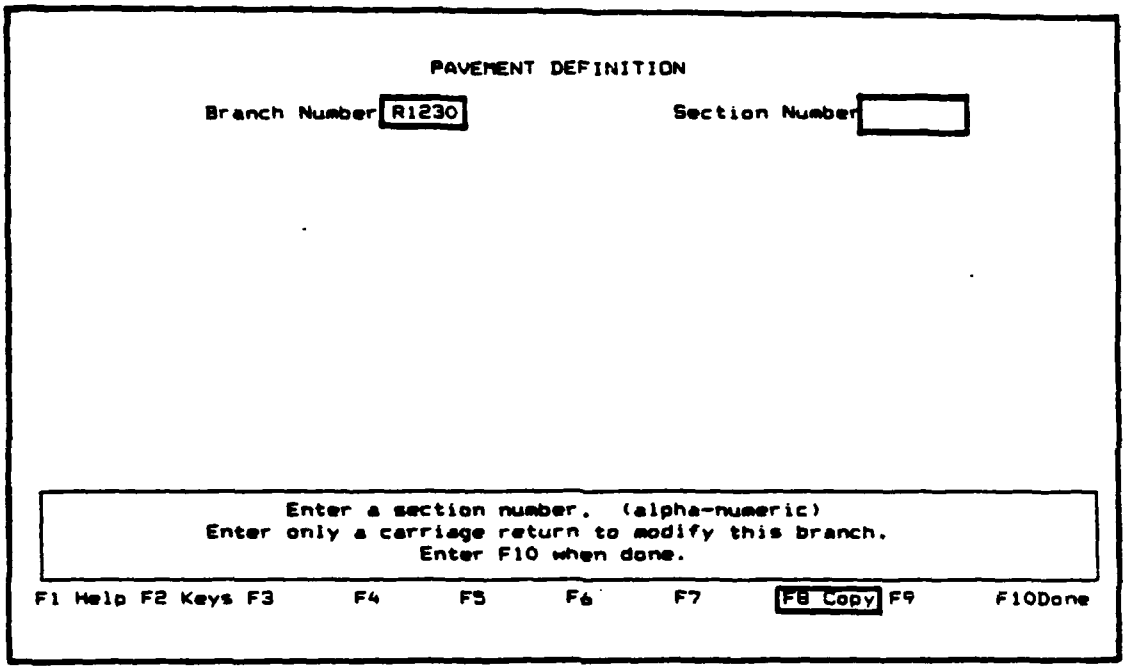
The new branch will now contain the same pavement definition data as the branch that was duplicated.



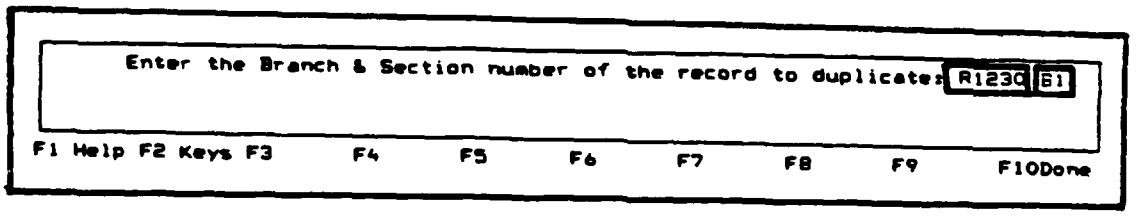
You may move through this information and make modifications as needed. Once you have scrolled through the entire screen or have pressed the F10 Done key, you can [A] Accept the record as shown, [M] Modify the record, or [Q] Quit and discard the branch definition.

Copying Section Information

Another option that may be utilized when defining a new section is the Copy Function, F8. To copy section definition information from an existing section to a new section, press F8 after inputting the branch number on the pavement definition screen.

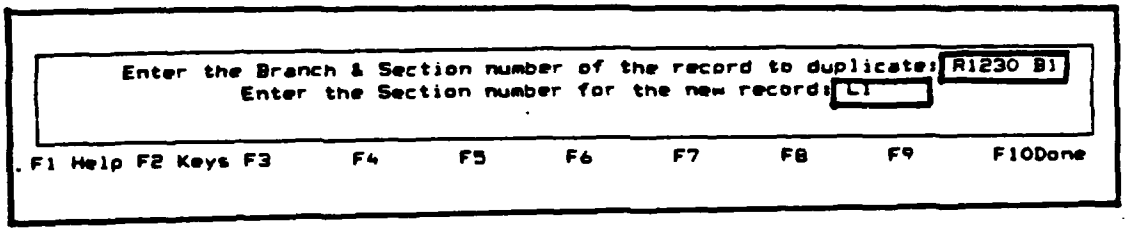


After F8 has been selected you must input the branch number and section number of the record to be duplicated.

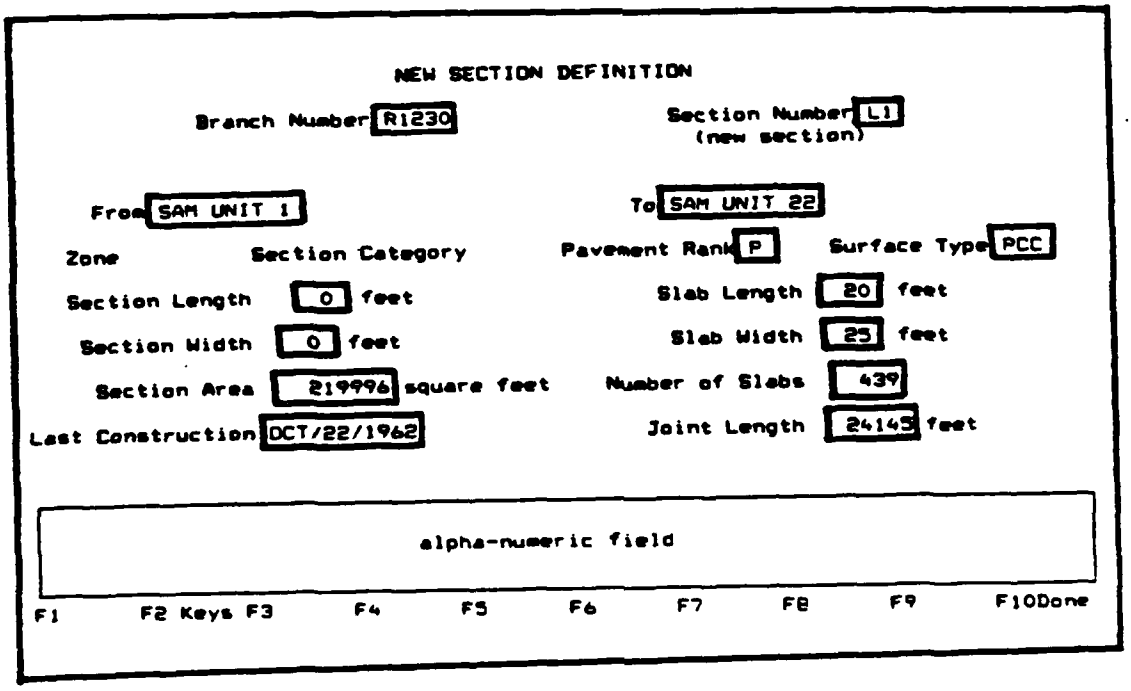


The F1 Help key can be used to list the branch numbers and section numbers available in the current database.

The section number for the new record should be input.



The new section will now contain the same pavement definition data as the section that was duplicated.



You may move through this information and make modifications as needed. Once you have scrolled through the entire screen or have pressed the F10 Done key, you have the choice of [A] Accept the record, [M] Modify the record, or [Q] Quit and discard the section definition.

Modifying Existing Branch Information

To modify or add information to the branch definition record, enter the branch number corresponding to the record you want to modify. Use the F1 Help key to list the branch numbers in your database.

Entering a section number will allow you to modify existing section definition information. To modify branch information, enter a carriage return.

The previously entered branch information will appear on the screen. At that time, you will be asked whether you want to [M] Modify, [S] Select a different record, [P] Purge, or [Q] Quit.

Select: **M** to Modify or add any information to what appears on your screen. You will be allowed to move through the screen in order to modify information. Modify data according to the formats described under "Entering a New Branch".

S to Select a different record. You will be allowed to choose a different branch number.

P to Purge the record. The following prompt will appear at the bottom of your screen.

```
All information in the database related to this branch will be purged.
Continue? (Yes or No)
```

Answering yes will delete <u>all</u> information in your database concerning this branch.

Q to end branch modification. Your record will be stored as shown on the screen and you will be allowed to choose another branch number. Use the F10 Done key if you do not want to modify another branch. You will be taken to the Data Entry and Modification menu.

Modifying Existing Section Information

To modify or add information to the section definition record, enter the Branch and Section numbers corresponding to the record you want to modify. Use the F1 Help key to list the branch numbers and section numbers stored in your database.

The previously entered section information will appear on your screen. At that time you will be asked whether you want to [M] Modify, [S] Select a different record, [P] Purge, or [Q] Quit.

Select: **M** to Modify or add any information to what appears on your screen. You will be allowed to move through the screen to modify information. Modify data according to the formats described under "Entering a New Section".

S to Select a different record. You will be allowed to choose a different section number for the branch.

P to Purge the record. The following prompt will appear at the bottom of your screen.

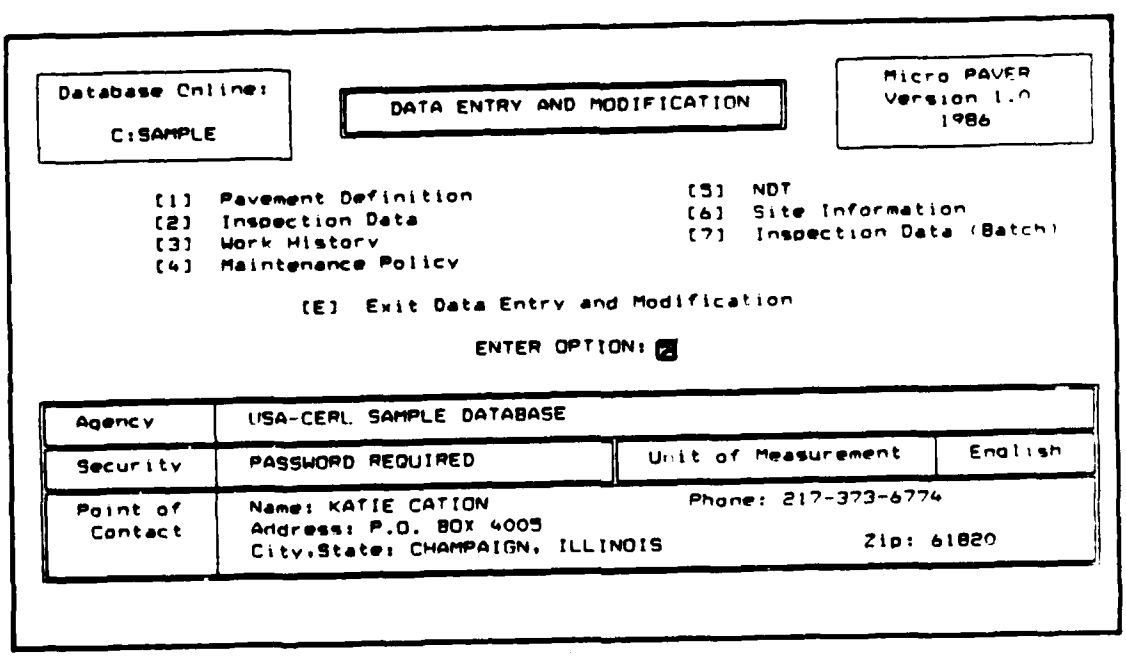
```
All information in the database related to this section will be purged.
Continue? (Yes or No)
```

Answering yes will delete <u>all</u> information in your database concerning this section.

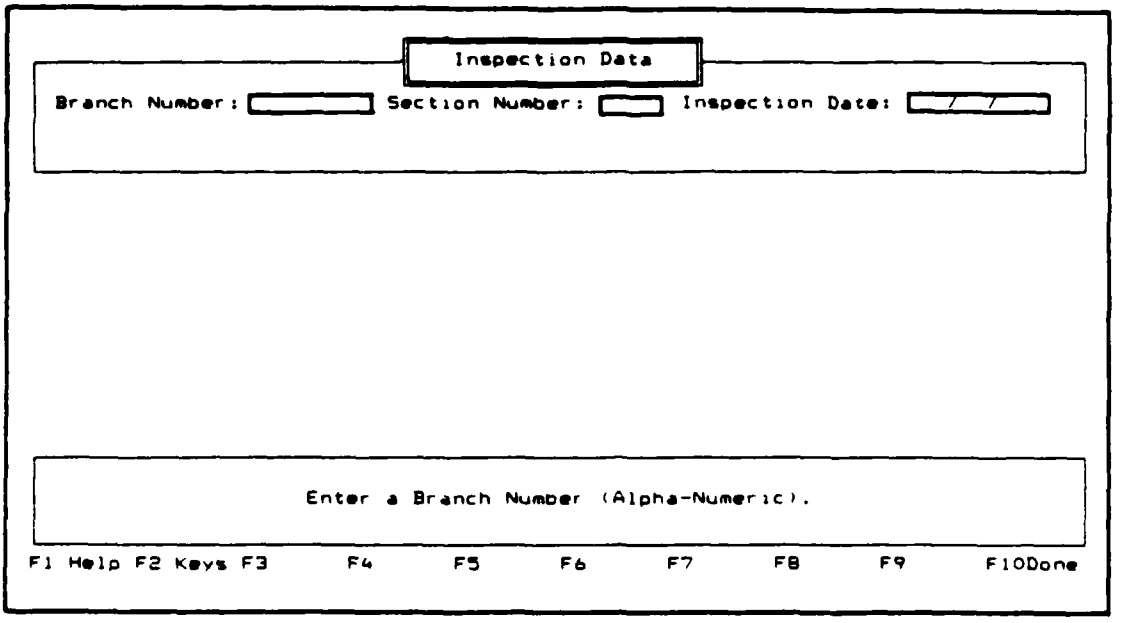
Q to end Section Modification. Your record will be stored as shown on the screen and you will be allowed to enter another section number for the branch. Use the F10 Done key if you do not want to modify another section. You will be taken to the Data Entry and Modification menu.

Inspection Data

Once a branch and section have been defined, pavement inspection results can be entered into your database. The inspection data option allows you to enter this type of information. To access the inspection data option, select option 2, Inspection Data, from the Data Entry and Modification menu.



The following prompts will appear on your screen.



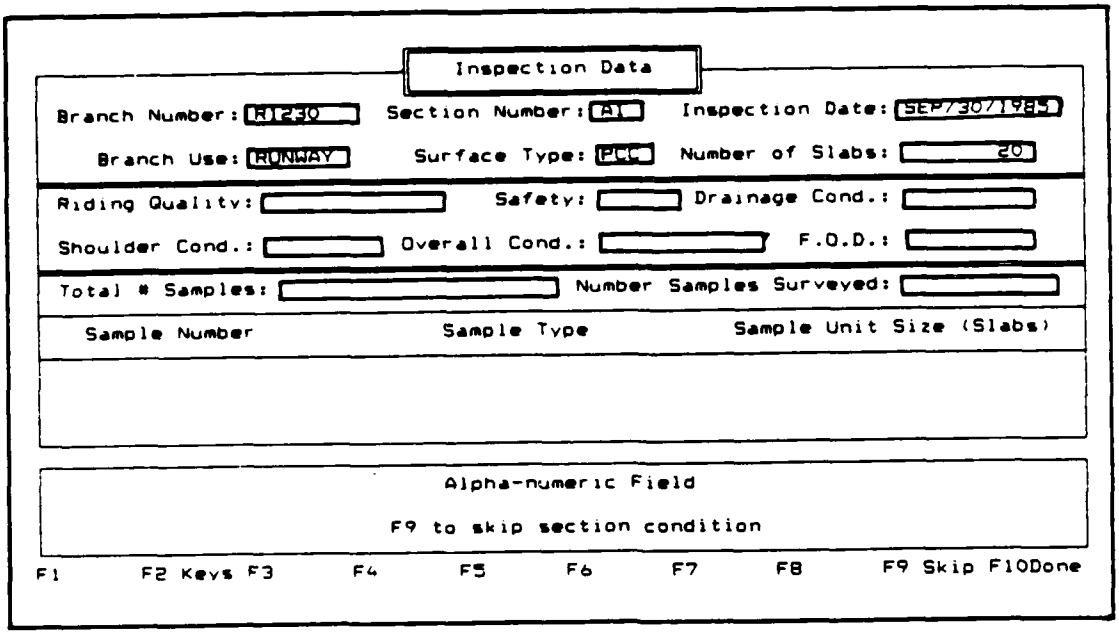
Enter your data according to the following formats:

1) Branch number - Enter the branch number corresponding to the branch you want to enter inspection data for. The branch must have been defined previously to enter inspection information. Branch numbers currently in the database will be listed by using the F1 Help Key.

2) Section number - Enter the section number corresponding to the section you wish to enter inspection data for. The section must have been defined previously to enter inspection data. Section numbers currently in the database can be listed by using the F1 Help Key.

3) Inspection date - Enter the date on which the inspection occurred. The date must be in the format MMM/DD/YYYY. For example, SEP/25/1985 or SEP/25/85.

After the data have been entered, the following prompts will appear:



You will notice that Branch Use, Surface Type, and Number of Slabs (PCC Pavements) or Area (AC Pavements) are retrieved from the section definition record and listed at the top of your screen. New data should be entered according to the following formats.

4) Riding Quality - Enter a maximum of 3 alpha-numeric characters to rate the overall riding quality of the section. The user may use any rating scale desired.

5) Safety - Enter a maximum of 3 alpha-numeric characters to rate the overall safety condition of the section. The user may use any rating scale desired. For example, the skid number may be entered here.

6) Drainage Condition - Enter a maximum of 3 alpha-numeric characters to rate the drainage conditions of the section. The user may use any rating scale desired.

7) Shoulder Condition - Enter a maximum of 3 alpha-numeric characters to rate the condition of the shoulders in this section. Any rating scale may be used.

8) Overall Condition - Enter a maximum of 3 alpha-numeric characters to rate the overall condition of this section. Any rating scale may be used.

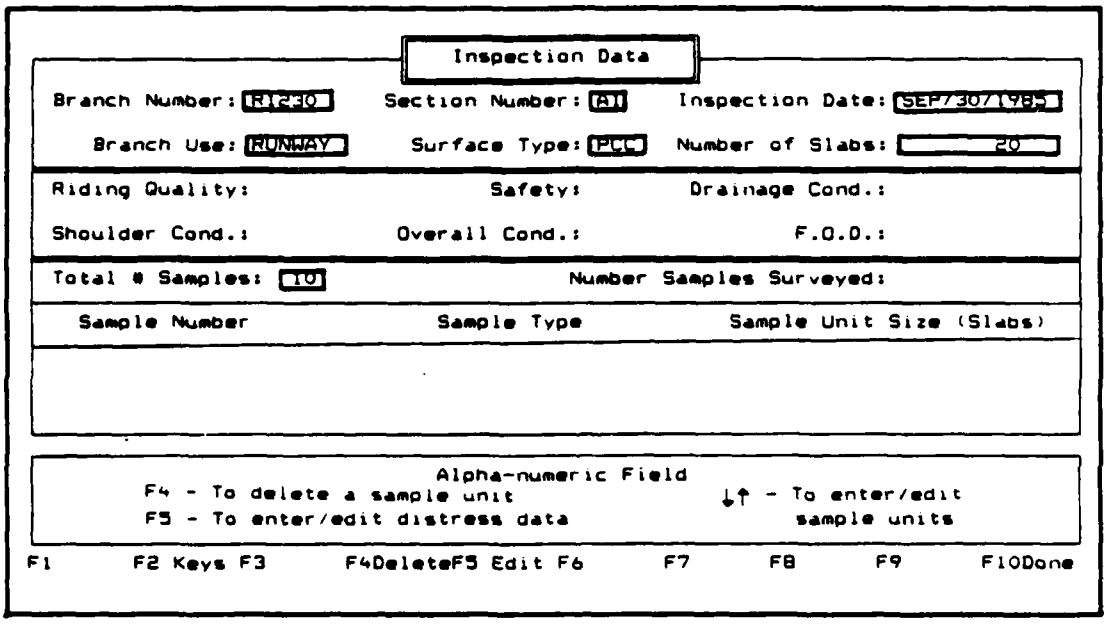
9) F.O.D. - Enter a maximum of 3 alpha-numeric characters to rate the foreign object damage potential of the section. Any rating scale may be used.

Note: You may skip the entire condition section by using the F9 function key. Skipping the section will not affect your results. This information is not used in calculating the PCI.

After entering section condition information or skipping the entire section, the following information is requested.

10) Total # Samples - This is a required field. Enter the total number of sample units in your section - not just the number of sample units inspected. Only integers are valid.

Once the total # of sample units is entered, the following screen appears for a concrete inspection. The screen is similar for an asphalt inspection.



The number of samples surveyed will be updated automatically each time you accept the distress information you enter. The rest of the information should be entered according to the following format.

11) Sample number - Enter a maximum of 3 alpha-numeric characters which represents the sample unit.

12) Sample type - Enter R for a random sample unit or A for an additional sample unit.

13) Sample unit size - Enter the sample unit size in square feet (meters) for AC pavements or # of slabs for PCC pavements. Enter up to 8 integers. The sample unit size cannot exceed the section area or # of slabs in a section.

You will then be asked, "Do you want to add distress codes for this sample number?" (Y/N).

Enter: N for No. You will be allowed to enter another sample number, sample type, and sample unit size.

Y for Yes. You will then be asked to enter the results of your pavement inspection survey for this sample unit. The following information will be requested.

14) Distress Code - Enter the one or two digit code that represents the distress type identified during the survey. Valid distress codes for AC roads and streets are 1-19, PCC roads and streets 21-39, AC Airfields 41-56, and PCC Airfields 61-75. The help menu, which can be accessed through F1, contains a list of the distresses and their corresponding distress codes. Table 1 provides a list of the distresses and corresponding distress codes

15) Distress Description - The distress description that corresponds to the distress code is automatically entered.

16) Severity - Enter L for Low Severity, M for Medium, or H for High Severity.

17) Quantity - Enter, in a maximum of 5 integers the quantity of the distress. The quantity should be in the same unit of measurement as the distress. The distress quantity total cannot exceed the sample unit size.

Repeat the Distress Code, Severity and Quantity for all distress types identified during the survey. Press the F10 Function Key after all distresses have been entered. After completing the distress information, you will be asked to [A] Accept, [M] Modify, or [Q] Quit.

TABLE 1

Pavement Distress Types and Corresponding Codes

AC ROADS and PARKING LOTS

CODE	DISTRESS TYPE
1	ALLIGATOR CRACKING
2	BLEEDING
3	BLOCK CRACKING
4	BUMPS/SAGS
5	CORRUGATION
6	DEPRESSION
7	EDGE CRACKING
8	JOINT REFLECTION CRACKING
9	LANE/SHOULDER DROP
10	LONGITUDINAL/TRANVERSE CRACKING
11	PATCH/UTILITY CUT
12	POLISHED AGGREGATE
13	POTHOLE
14	RAILROAD CROSSING
15	RUTTING
16	SHOVING
17	SLIPPAGE CRACKING
18	SWELL
19	WEATHERING/RAVELING

PCC ROADS and PARKING LOTS

CODE	DISTRESS TYPE
21	BLOW-UP/SHATTER
22	CORNER BREAK
23	DIVIDED SLAB
24	DURABILITY CRACKING
25	FAULTING
26	JOINT SEAL DAMAGE
27	LANE/SHOULDER DROP
28	LINEAR CRACKING
29	LARGE PATCH/UTILITY CUT
30	SMALL PATCH
31	POLISHED AGGREGATE
32	POPOUTS
33	PUMPING
34	PUNCHOUT
35	RAILROAD CROSSING
36	SCALING/CRAZING
37	SHRINKAGE CRACKING
38	CORNER SPALLING
39	JOINT SPALLING

AC AIRFIELDS

CODE	DISTRESS TYPE
41	ALLIGATOR CRACKING
42	BLEEDING
43	BLOCK CRACKING
44	CORRUGATION
45	DEPRESSION
46	JET BLAST
47	JOINT REFLECTION CRACKING
48	LONGITUDINAL/TRANSVERSE CRACKING
49	OIL SPILLAGE
50	PATCHING
51	POLISHED AGGREGATE
52	WEATHERING/RAVELING
53	RUTTING
54	SHOVING
55	SLIPPAGE
56	SWELLING

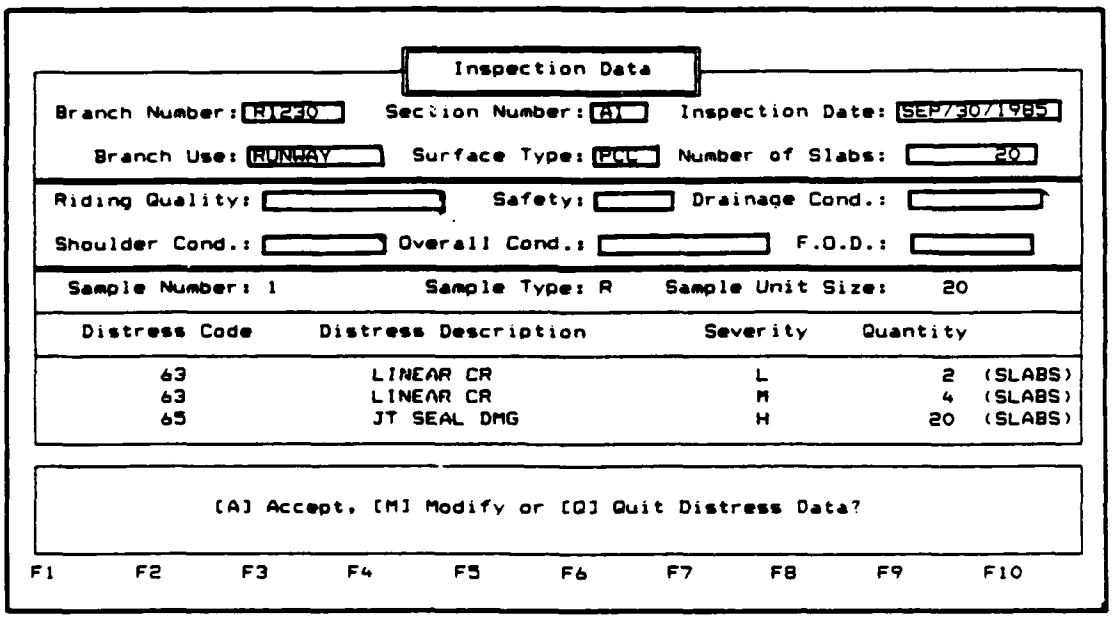
PCC AIRFIELDS

CODE	DISTRESS TYPE
61	BLOW-UP
62	CORNER BREAK
63	LINEAR CRACKING
64	DURABILITY CRACKING
65	JOINT SEAL DAMAGE
66	SMALL PATCH
67	LARGE PATCH/UTILITY
68	POPOUTS
69	PUMPING
70	SCALING/CRAZING
71	FAULTING
72	SHATTERED SLAB
73	SHRINKAGE CRACKING
74	JOINT SPALLING
75	CORNER SPALLING

Select: **A** to Accept the information as shown on the screen. You will then be taken back to the sample unit information where you have the option of entering/editing distress data (F5 key), entering/editing sample units (scrolling keys), or deleting a line (F4 key). Use the F10 Done key when you are finished entering sample unit information.

M to Modify the information that appears on the screen. You will be taken back to the section condition section.

Q to Quit and discard the inspection data. Your information will not be stored and you will be taken to the sample unit information where you have the option of entering/editing distress data (F5 key), entering/editing sample units (scrolling keys), or deleting a line (F4 key). Use the F10 Done key when you are finished entering sample unit information.



When you have finished entering sample unit information and have hit the F10 Done key, you will be asked to [A] Accept, [M] Modify, or [Q] Quit.

Select: **A** to Accept the information as shown on the screen. You will then have the option of printing out the PCI calculation results at your terminal, printer, on a file, or you may quit.

M to Modify the information that appears on the screen. You will be taken back to the section condition section.

Q to Quit and discard the inspection data. Your information will not be stored and you will be allowed to enter another branch number. Use the F10 Done key to return to the Data Entry and Modification menu.

Following is an example of the PCI calculation information which is produced after the distress record has been accepted. This information may be printed at your terminal, printer, on a file, or you may quit Inspection Data.

DATE SURVEYED = SEP/30/1985 BRANCH/SECTION NUMBER = R1230/A1

SECTION SIZE = 20 SLABS

TOTAL NUMBER OF SAMPLE UNITS = 10

ALLOWABLE ERROR WITH 95% CONFIDENCE = 5

SAMPLE UNIT ID = 1
SIZE OF SAMPLE = 20 SLABS

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
63 LINEAR CR	LOW	2	10.00	8.6
63 LINEAR CR	MEDIUM	4	20.00	28.4
65 JT SEAL DMG	HIGH	20	100.00	12.0
71 FAULTING	LOW	1	5.00	4.6
75 CORNER SPALL	MEDIUM	3	15.00	9.8

PCI = 55

NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 1

NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0

PCI OF SECTION = 55 RATING = FAIR

RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.

STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = .0%

EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
63 LINEAR CR	LOW	2	10.00	8.6
63 LINEAR CR	MEDIUM	4	20.00	28.4
65 JT SEAL DMG	HIGH	20	100.00	12.0
71 FAULTING	LOW	1	5.00	4.6
75 CORNER SPALL	MEDIUM	3	15.00	9.8

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD RELATED DISTRESSES = 58.44 PERCENT DEDUCT VALUES.

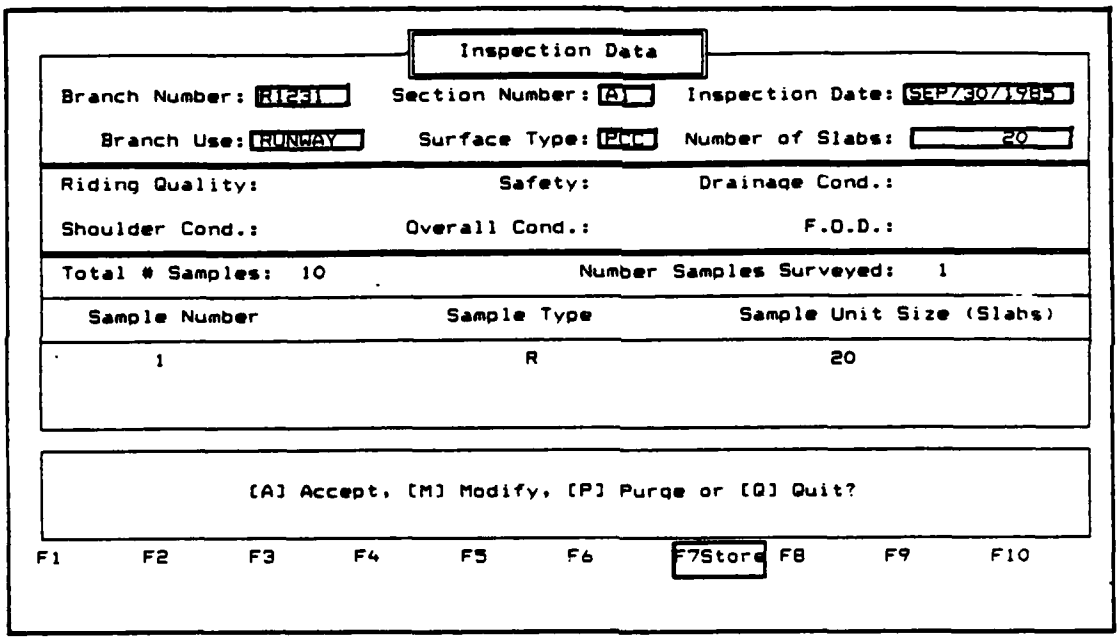
CLIMATE/DURABILITY RELATED DISTRESSES = 18.95 PERCENT DEDUCT VALUES.

OTHER RELATED DISTRESSES = 22.61 PERCENT DEDUCT VALUES.

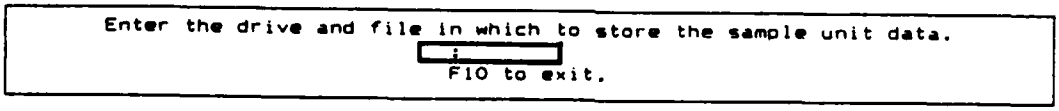
After the report has been printed, you will once again have the option of where to print another copy of the report. To exit the Inspection Data option, enter Q for quit. This will return you to the Inspection Data Entry screen. Use the F10 Key to return you to the Data Entry and Modification menu.

If you are concerned about the amount of hard disk storage being used up by your inspection results, there is an option available for storing inspection data in an external file. The data will be stored in a format which allows the data to be re-entered into the database if desired.

To use this feature, enter the Branch Number, Section Number, and Inspection Date of the record you wish to store. The sample unit data stored in your database will appear on your screen.



Use the F7 Store key to initialize the procedure. The following prompt will appear on the screen:

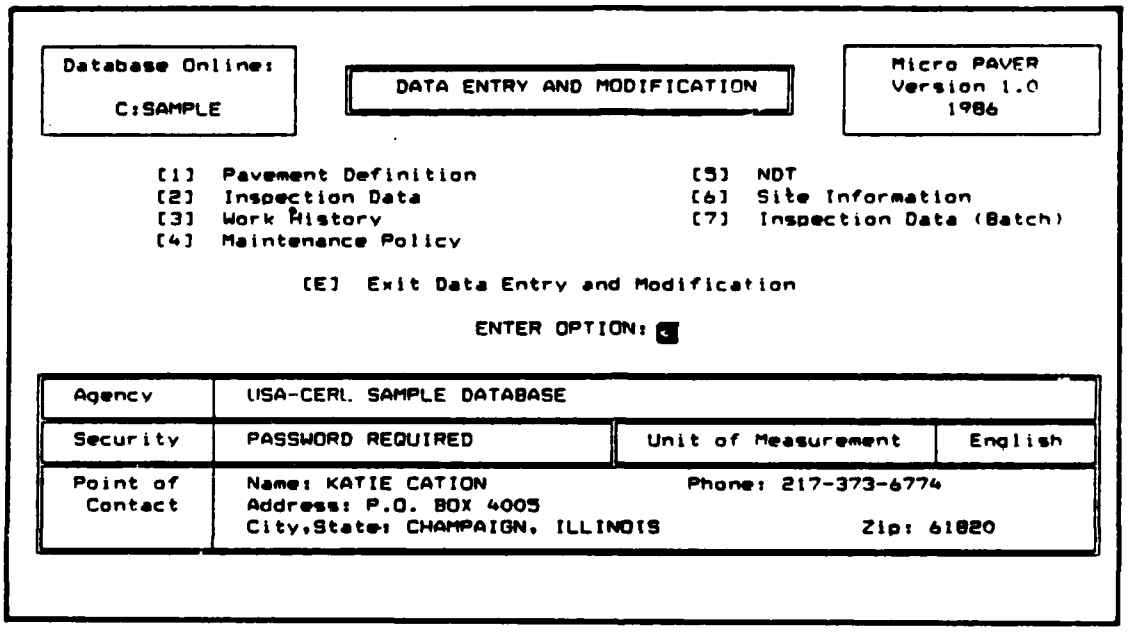


Enter the letter which identifies the drive and the file name in which you wish to store the sample unit data. All inspection data associated with that branch number, section number, and inspection date will be stored. You will then be returned to the beginning of the inspection data form.

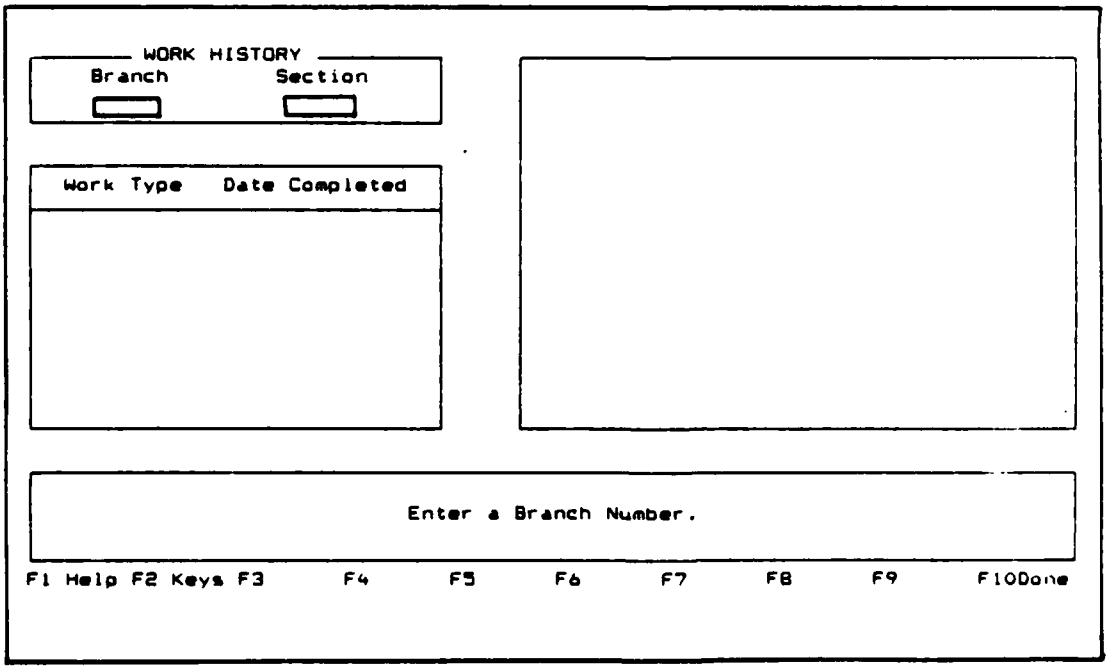
To reload your inspection data, select option 7, Inspection Data (Batch), from the Data Entry and Modification menu. The procedures involved are described later in this chapter.

Work History

The work history option allows you to record any construction and/or maintenance work which has been applied to a section. To access the work history option, select option 3, Work History, from the Data Entry and Modification menu.



The following prompts will appear on your screen.



Enter your data according to the following formats:

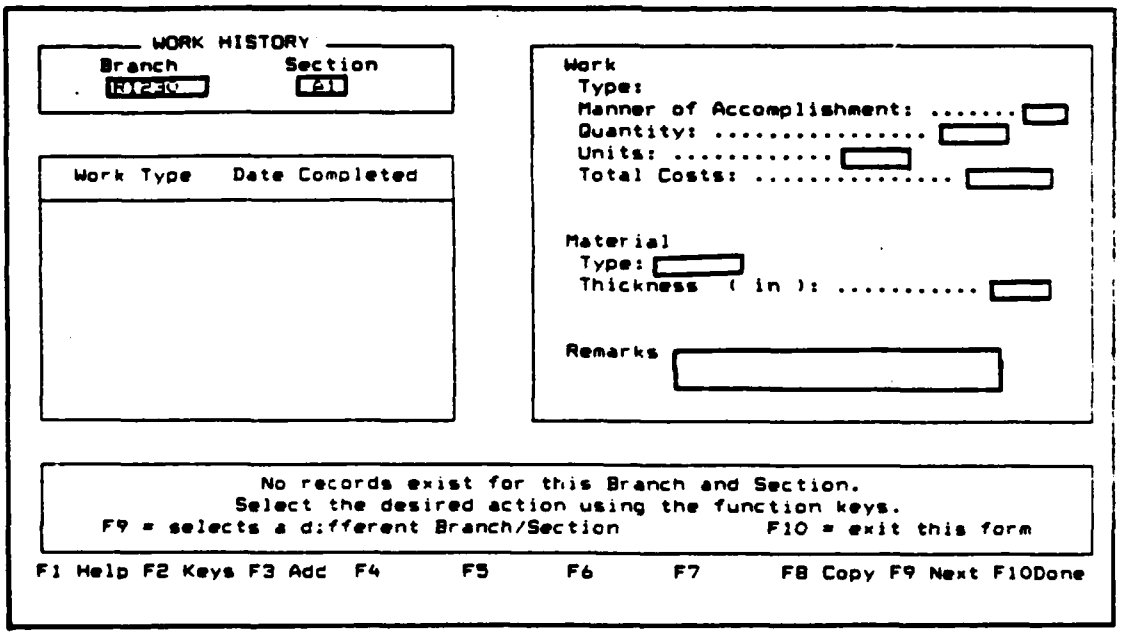
1) Branch number - Enter the branch number corresponding to the branch you want to enter the work history data for. The branch must have been defined previously in order to enter work history information. Branch numbers currently in the database can be listed by using the F1 Help key.

2) Section number - Enter the section number corresponding to the section you want to enter work history data for. The section must have been defined previously in order to enter work history information. Section numbers currently in the database can be listed by using the F1 Help Key.

After entering the branch and section numbers, any previously entered work types and dates that were completed will be listed in the left hand box. More specific data about the last work type accessed will appear in the right hand box. Modifying previously entered data will be discussed later in this section.

Entering Work History Information - No information previously entered.

Your screen will appear as shown below:



Use the F3 Add key to add data to the record. You will be prompted as described below. The F8 Copy key allows you to copy work types from previously entered records. The copy function is described later in this section.

Add information requested according to the following formats:

3) Work Type - Enter the alpha-numeric work type code that represents the type of work done to the section. A table of work types and their codes is available by using the F1 Help Key. The work type table is described further in Chapter 7 on System Utility. The work type description that corresponds to the code entered is automatically displayed.

4) Completed - Enter the date that this work type was completed. The date must be in date format MMM/DD/YYYY. For example, SEP/25/1985 or SEP/25/85.

5) Manner of Accomplishment - Enter I for work completed in-house and C for work done by contract.

6) Quantity - Enter the quantity of the work type which was performed in the units shown below quantity on the screen. You are allowed a maximum of 10 real numbers. Decimals are allowed.

7) Total Costs - The total costs are automatically calculated based on the unit cost stored in the work type table. To edit the costs used in the table, see Chapter 7 on System Utility. The total cost which was calculated may be over-ridden by entering a maximum of 7 integers.

8) Material Type - Enter the material type integer code that represents the type of material used for this work type. A table of material types and their codes is available by using the F1 Help key. The material type table is described further in Chapter 7 on System Utility. The material type description that corresponds to the code entered is automatically displayed.

9) Thickness - Enter the thickness in inches (centimeters) of this work type. You may enter a maximum of 5 real numbers. Decimals are allowed.

10) Remarks - Enter any remarks you feel may be pertinent to the work type. You may enter a maximum of 70 alpha-numeric characters.

After completing the form, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit.

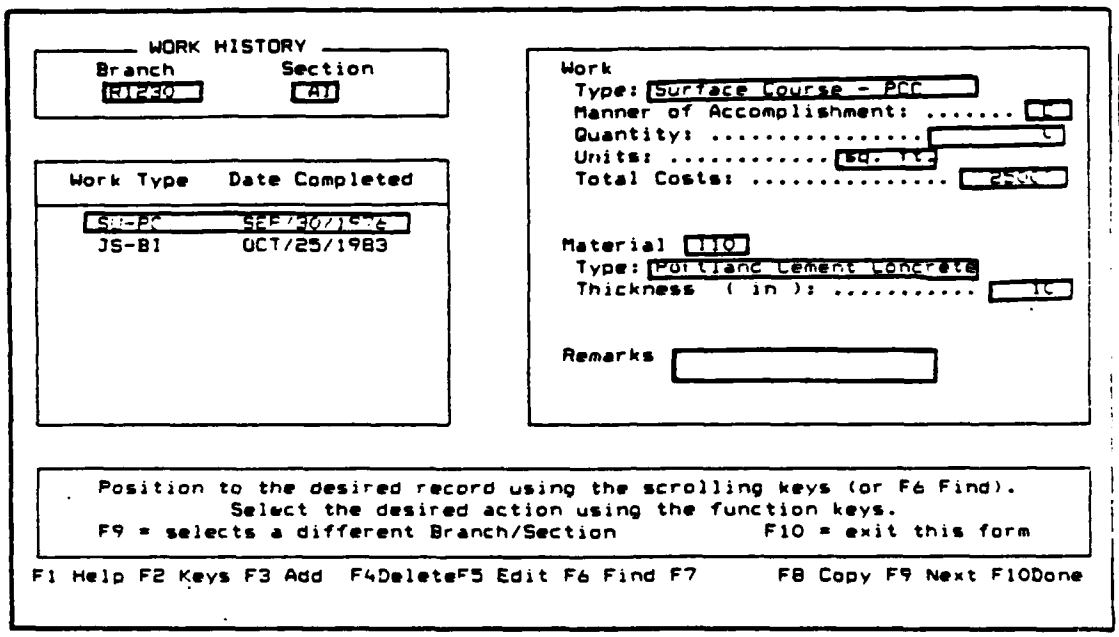
Select: **A** to Accept the record as shown. You will then be prompted to enter another work type for the same branch and section numbers. Use the F10 Done key to store your entry in the database and return to the Data Entry and Modification menu.

M to Modify the record. You will be allowed to modify any information entered from Manner of Accomplishment down through the rest of the record.

Q to Quit and discard this work history record. Your record will be discarded and you will be allowed to enter another work type. Use the F10 Done key to return to the Data Entry and Modification menu.

Entering Work History Information - Information previously entered.

When accessing the work history record for a Branch/Section number combination for which work types had previously been entered, those work types will appear on the screen as shown.



The chronologically earliest work type will be highlighted in the Work Type/Data Completed scrolling region on the left-hand side of your screen. The box on the right-hand side of the screen displays the record for the highlighted key in the scrolling region.

The following functions are available to the user:

* Add Information - Use the F3 Add Key to enter another work type for this particular Branch/Section number. Enter information according to the formats described under "Entering Work History Information - No Information previously entered".

* Delete Information - Use the scrolling keys (↑ arrow or ↓ arrow) to highlight the work type/date completed information in the left-hand box you wish to delete, or use the F6 Find key to locate and highlight a completion date and work type.

* Once the work type/date completed that you wish to delete is highlighted, use the F4 Delete Key to remove the record. You will receive the following warning message:

"This record will be permanently deleted.
Continue, Yes [Y] or No [N]?"

Enter a Y to delete the record or N to return the record.

* Edit Information - Use the scrolling keys (↑ arrow or ↓ arrow) to highlight the work type/date completed information in the left-hand box you wish to edit, or use the F6 Find Key to locate and highlight a completion date and work type.

  Once the work type/date completed that you wish to edit is highlighted, use the F5 Edit Key to edit the record. You will be taken back to the Manner of Accomplishment portion of the record, so that you can add to or change information on the record.

* Find Information - Use the F6 Find Key to locate a particular record of interest. You will be asked to enter the completion date and work type corresponding to the record you are trying to locate. Once located, the work type/date completed information will be highlighted in the box on the left-hand side and the record will be displayed on the right-hand side.

* Copy Information - Use the F8 Copy key to copy the work history record from another branch/section to the branch/section combination currently being worked on. You will be prompted to enter the branch number, section number, and work type of the record to be duplicated. The F1 Help key can be used to list data stored in the database.

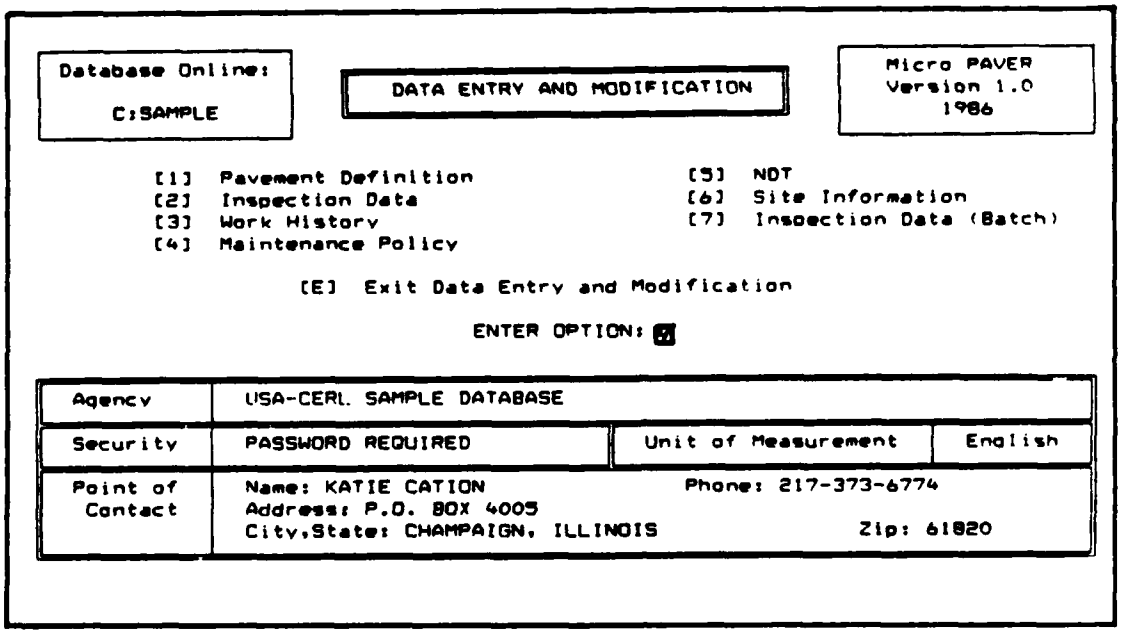
  You will then be prompted to enter the date completed for the new record. The default value is the most recent completion date from the copied record. The work history information for that specific work type will be duplicated from one section to another.

* Select a Different Branch/Section - Use the F9 Next Key to select a different section number for that particular branch number or to select a different branch.

* Exit Work History - After the results of a work history session have been accepted, use the F10 Exit Key to exit work history. You will be returned to the Data Entry and Modification menu.

Maintenance Policy

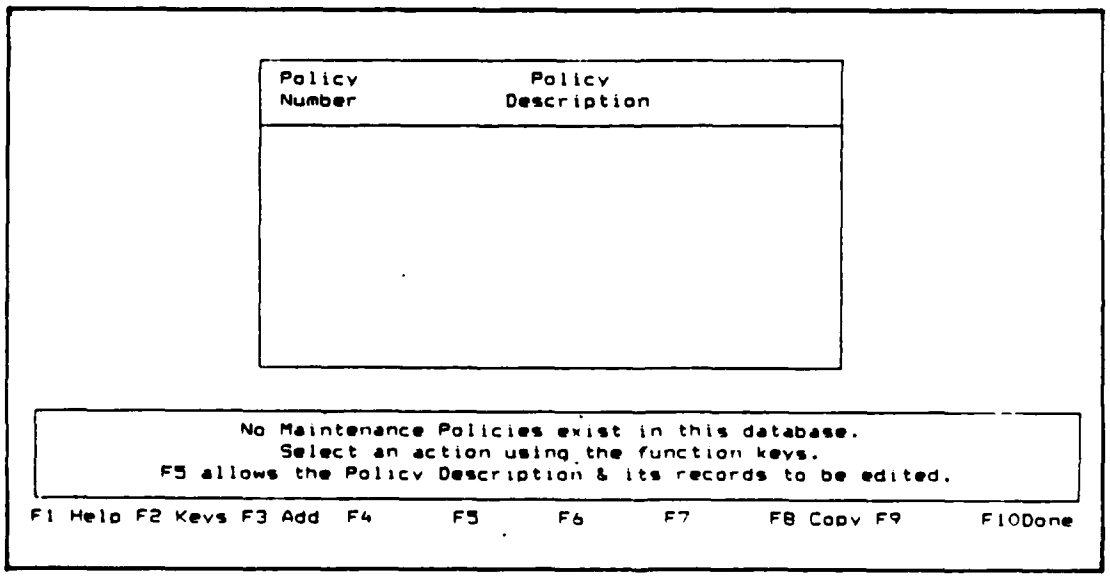
The maintenance policy option allows you to establish M & R policies for your agency. These policies may be applied in the M & R Report and Network Maintenance Report discussed in Chapter 4. To access the maintenance policy option, select option 4, Maintenance Policy, from the Data Entry and Modification menu.



Different options will be available depending on whether any maintenance policies were entered previously.

Entering Maintenance Policy Information - No Maintenance Policies Defined

If no Maintenance Policies have been entered into a database, the following prompt will appear on the screen.



The following functions are available to the user:

* Add information - Use the F3 Add key to enter a maintenance policy. Enter the information requested according to the following formats:

  Policy Number - Enter a maximum of 3 integers which represent the policy number.

  Policy Description - Enter a maximum of 30 alpha-numeric characters which describe the maintenance policy. The description may include the types of pavement this policy applies to.

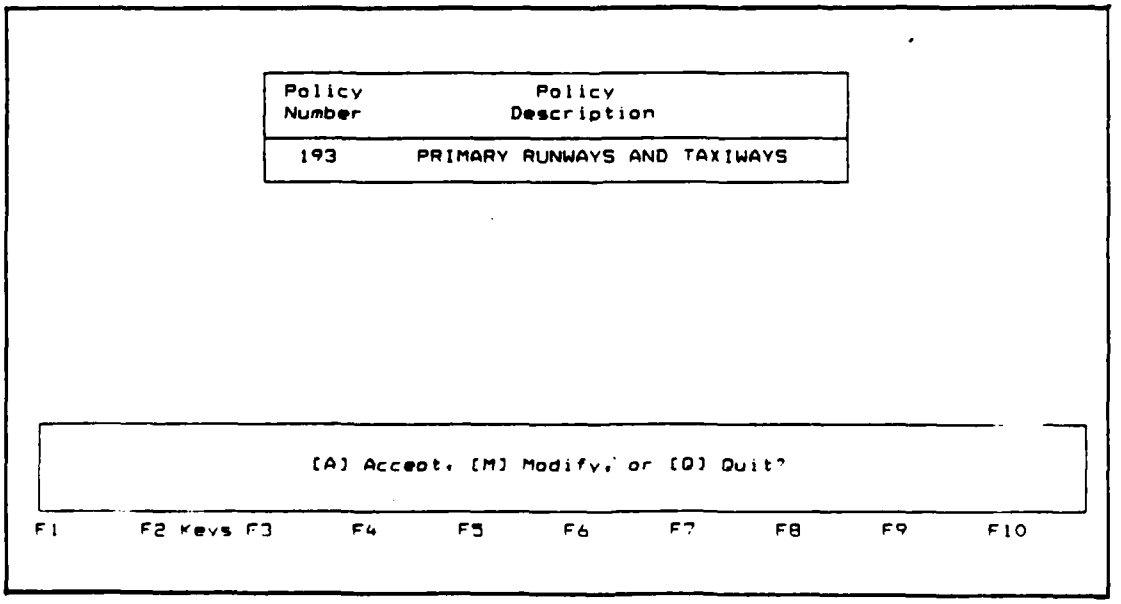
  After entering this information, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit this portion of the Maintenance Policy input form.

Select:

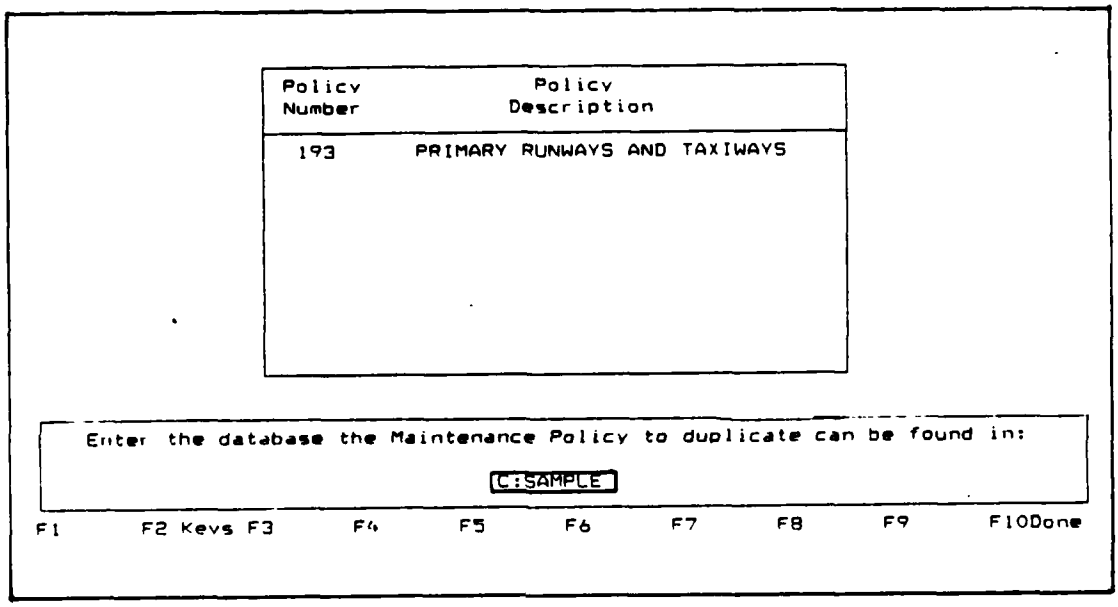
A to Accept the policy number and description as shown. You will be prompted to enter another policy number. Use the F10 Done key after entering all desired policy numbers and descriptions. You will then have the option of adding, deleting, editing, or copying your policies as discussed in the next section.

M to Modify the policy number or description. Position the highlighted box over the information to be modified. Your inputs will be retained until you change them. Use the F10 Done key after modifications are complete.

Q to Quit the entry of the policy number and description. Your entry will be discarded and you will be returned to the Data Entry and Modification menu if no other policies have been entered.



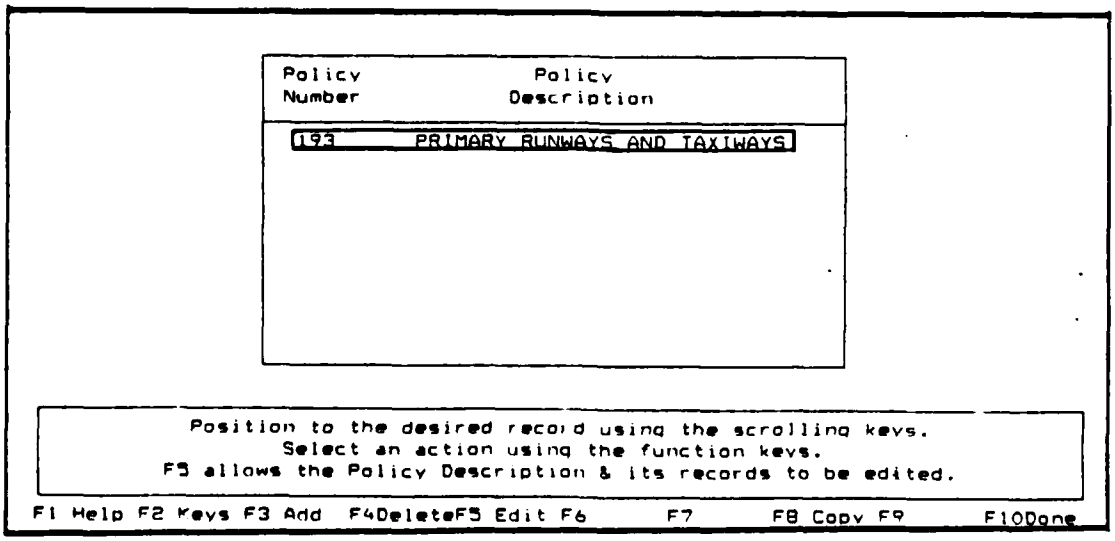
* Copy Information - Use the F8 Copy key to copy a maintenance policy from another database. You will be prompted to enter the drive and database name where the policy to be duplicated can be found..



You will then be asked to enter the policy number to be duplicated from the other database. The maintenance policy will be copied to the database online. You will then have the option of adding, deleting, editing, or copying your policies as discussed in the next section.

Entering Maintenance Policy Information - Maintenance Policies Defined

When a maintenance policy number has been stored in the database, the user is shown the first maintenance policy form. This form lists all policy numbers that are stored in the database and their descriptions.



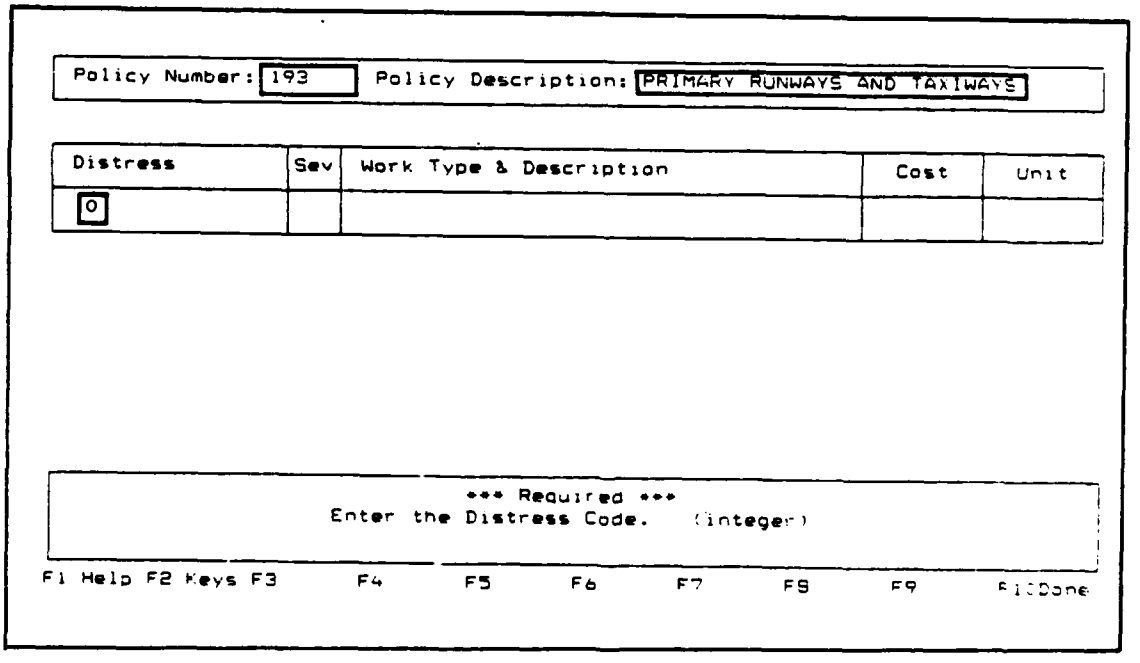
The following functions are available to the user:

* Add Information - Use the F3 Add key to enter another maintenance policy number and description. Enter the information requested according to the guidelines in the previous section.

* Delete Information - Use the scrolling keys (↑ arrow or ↓ arrow) to highlight the policy number you wish to delete. Use the F4 Delete key to remove it from the record. All activities associated with the policy number will be deleted.

* Edit Information - Use the scrolling keys (↑ arrow or ↓ arrow) to highlight the policy number you wish to edit. A second form will appear on your screen which enables you to add, delete, or edit the repairs included under a policy number.

  If no distress/repair data have been entered for the policy, the following prompts will appear on your screen.



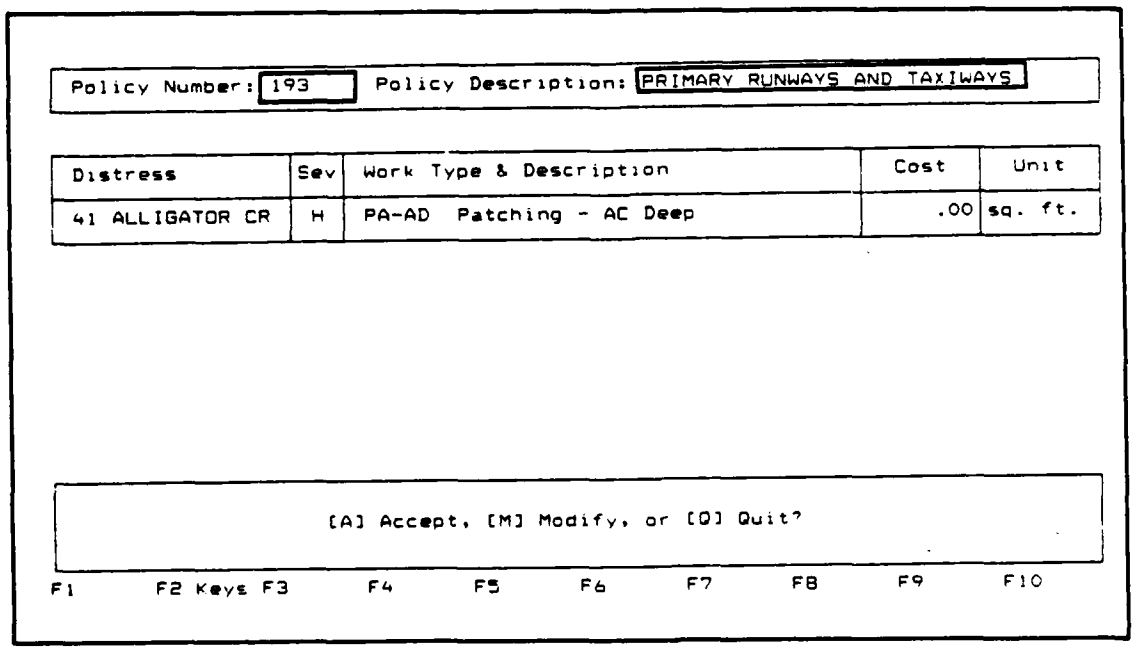
The user may now define what repairs will be performed to each distress type/severity combination when this policy is applied. Enter inputs according to the following guidelines:

Distress: This is a required field. Enter the two digit code which identifies the distress type you wish to repair. Use the F1 Help key to display a list of the distress codes associated with each distress type. Use the PgUp and PgDn keys to toggle between distress tables. Page 1 lists distress codes for AC Roads (1-19), Page 2 for PCC Roads (21-39), Page 3 for AC Airfields (41-56), and Page 4 for PCC Airfields Pavements (61-75).

Severity: This is a required field. Enter the distress severity corresponding to the distress type you wish to repair. Valid entries are L for Low, M for Medium, or H for High.

Work Type: Enter the maximum five alpha-numeric character code which identifies the type of work to be applied to the distress type/severity combination being addressed. Use the F1 Help key for a list of the defined maintenance activities which may be applied. If the maintenance activity you wish to apply is not listed in the table, follow the procedures described in Chapter 7 for editing this table.

You will then be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the distress repair as shown.

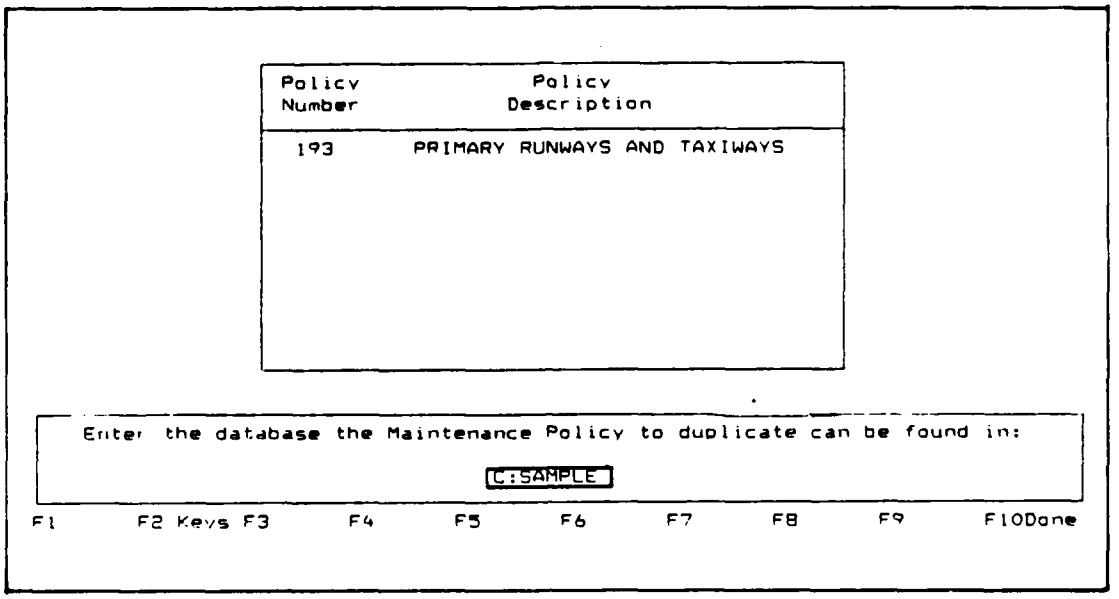


Select: **A** to Accept the record as shown. You will be prompted to repeat the procedure for another distress type. Use the F10 Done key when finished. Your entire policy will be displayed. Use the F10 Done key two more times to leave Maintenance Policy.

M to Modify the record shown. Use the carriage return or tab key to position the cursor at the item you wish to modify. Your entries will be retained until you save them.

Q to Quit the procedure. Your entry will be discarded and you will be taken to the second policy form which displays your policy.

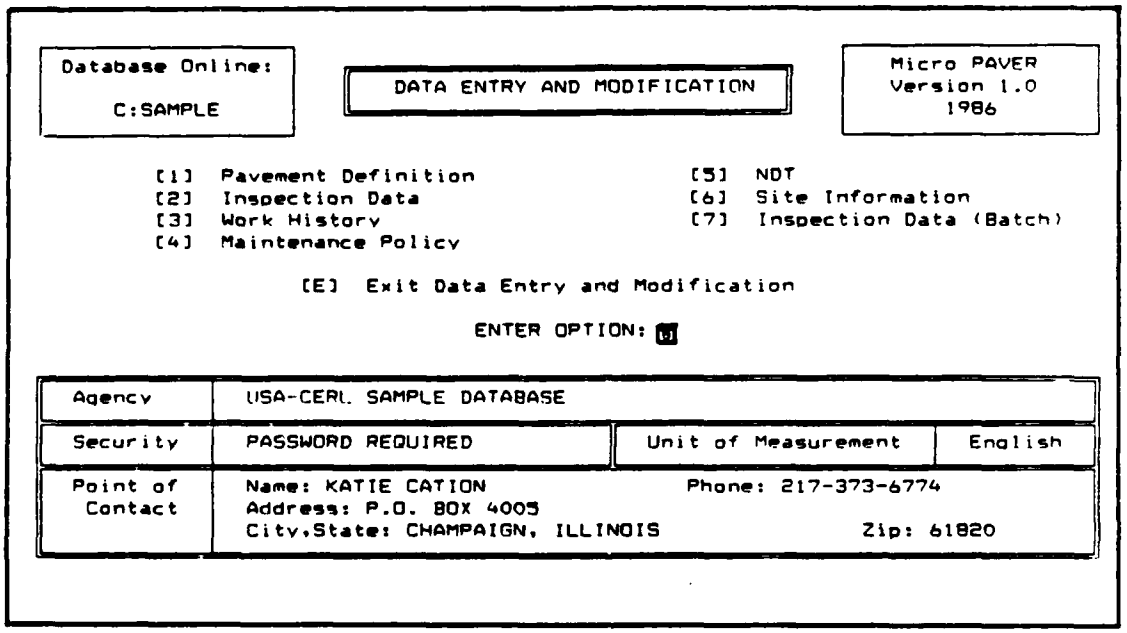
* Copy Information - Use the F8 Copy key to copy a maintenance policy from another database. You will be prompted to enter the drive and database name where the policy to be duplicated can be found.



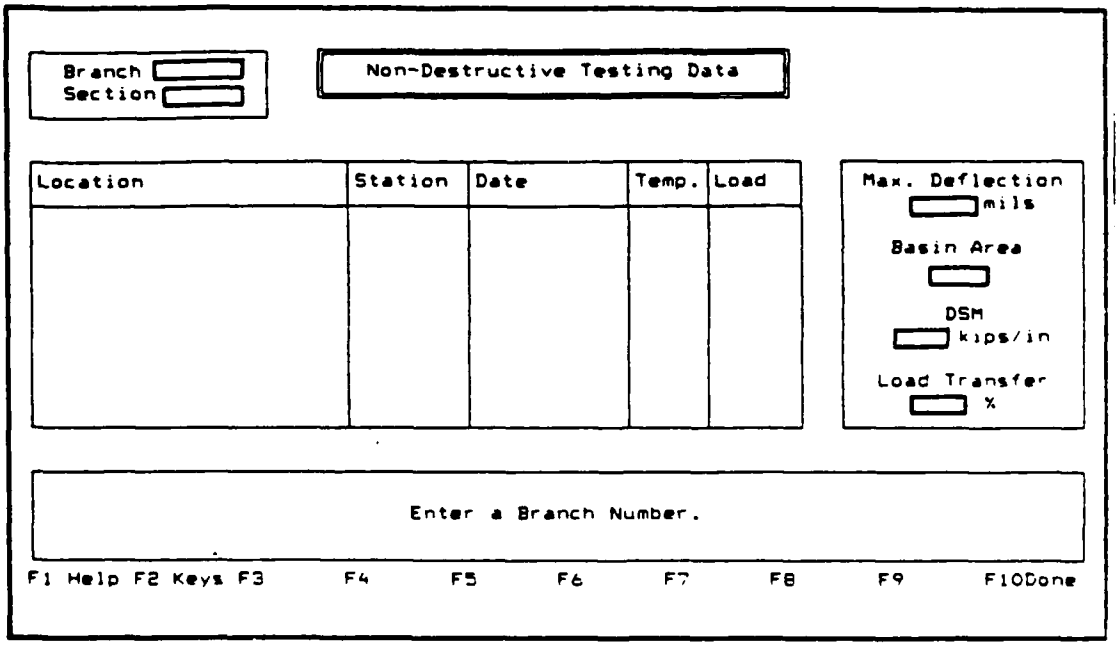
You will then be asked to enter the policy number to be duplicated from the other database. The maintenance policy will be copied to the database online. You will then have the option of adding, deleting, editing, or copying your policies.

NDT

The NDT option allows you to store the results from your non-destructive deflection testing. At the present time, none of the NDT test results are used in any of the Micro PAVER reports. It is available for your own information. To access the NDT option, select option 5, NDT, from the Data Entry and Modification menu.



The following prompts will appear on your screen.

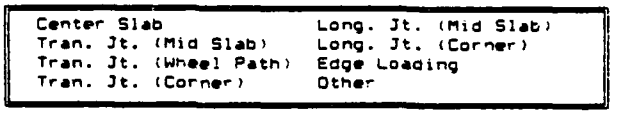


Enter the maximum 5 character Branch Number and 3 character Section Number in which the NDT was performed. Use the F1 Help key to identify the branch numbers and section available in this database.

Entering NDT Data for the First Time

If no NDT results have been entered for this particular branch and section number, you will be prompted to begin entering the data required. Use the following guidelines to enter your information.

Location: This is a required field. A box of possible test locations will appear on your screen. These locations are a function of surface type. An example of the box for PCC pavements appears below.



Use the scrolling keys to position the highlighted box over the location where the test was performed. Use the F3 Add key to enter that location onto the form.

Station: Enter a maximum of 7 real numbers which represent the station where the test was performed. Decimals must be used in place of a plus sign (+).

Date: This is a required field. Enter the date on which the test was performed in date format (MMM/DD/YYYY or YY).

Temperature: Enter the air temperature in degrees Fahrenheit (Celsius). A maximum of 5 real numbers may be entered.

Load: Enter the test load in pounds (kilograms). A maximum of 6 integers may be used.

Maximum Deflection: Enter the maximum test deflection in mils (millimeters). A maximum of 7 real numbers may be entered.

Basin Area: Enter the deflection basin area (unitless). A maximum of 6 real numbers may be entered.

DSM: If the test load and maximum deflection have been entered, the DSM (Dynamic Stiffness Modulus) will be automatically calculated:

$$\frac{\text{Test load (lbs)(kgs)}}{\text{Max defl (mils)(mm)}} = \text{DSM (kips/in)(kg/mm)}$$

A maximum of 6 real numbers may be entered to override the value calculated.

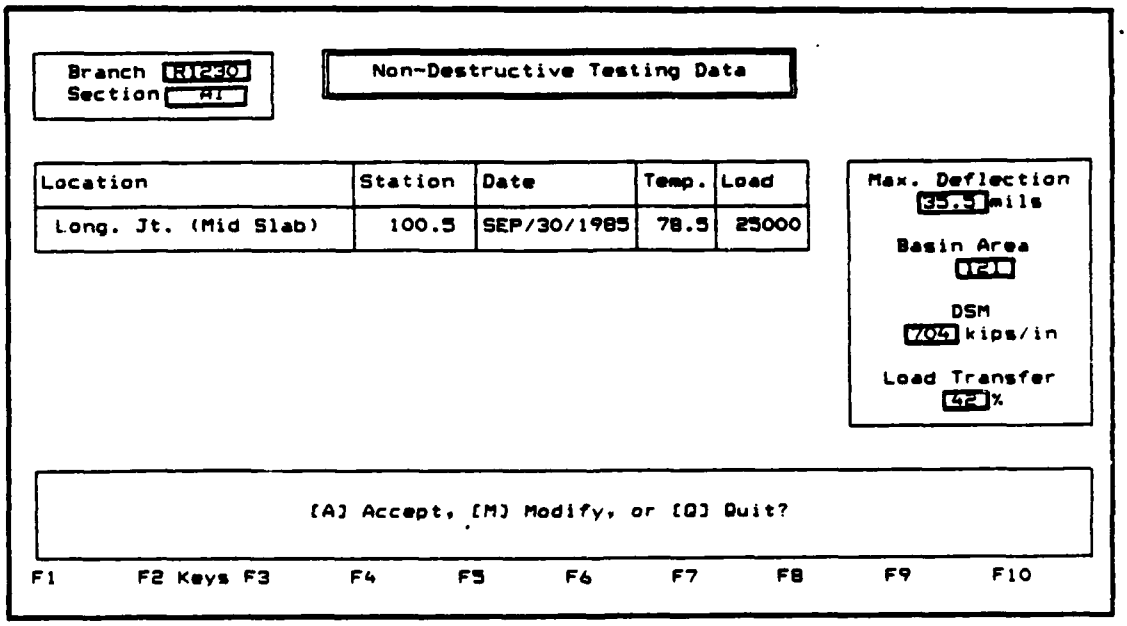
Load Transfer: Enter the load transfer in percent. A maximum of 100% may be entered.

After all information has been entered on the form, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the NDT form.

Select: **A** to Accept the information as it appears on the screen. You will then be prompted to enter the results from another NDT test. Use the F10 Done key when you are finished entering data.

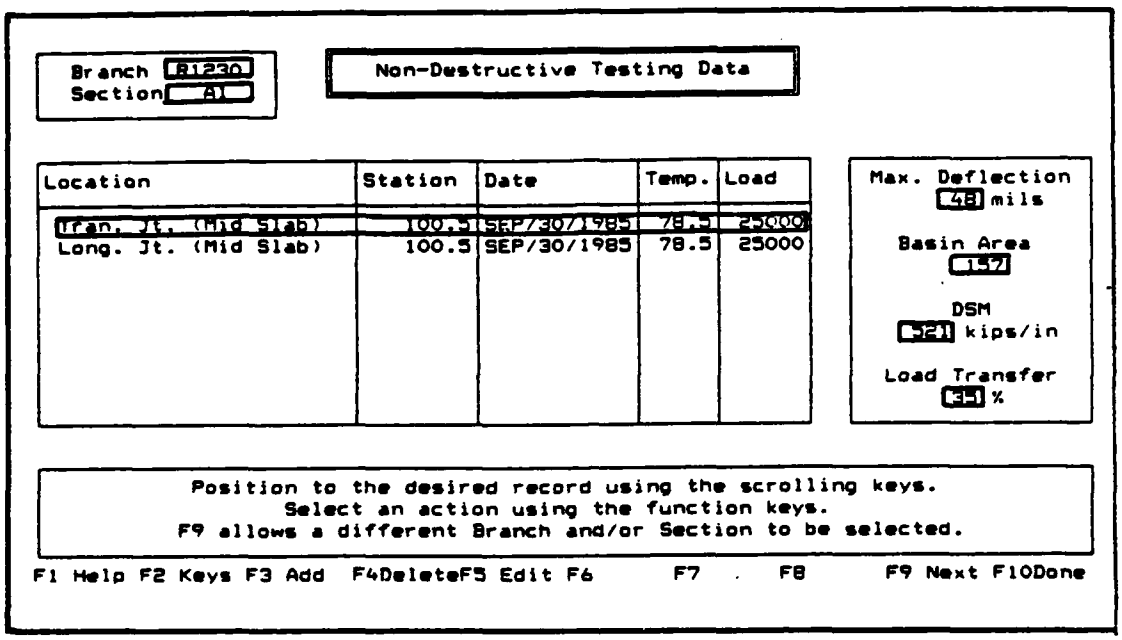
M to Modify any of the NDT information. You will be prompted to repeat the NDT data entry procedure. Your values will be retained until you change them. Use the F10 Done key after all your modifications have been completed and then use A to accept the changes.

Q to Quit the data entry process for that branch and section number. Your entries will be deleted and you will be prompted to enter another section number. Use the F10 Done key to leave the NDT form.



NDT Data Previously Entered

If NDT data has been stored in the database for the branch and section number selected, a scrolling table showing all tests stored in the database will appear on your screen.



The following functions are available to the user:

* Add Information - Use the F3 Add key to enter additional NDT data. Enter the information requested according to the guidelines in the previous section.

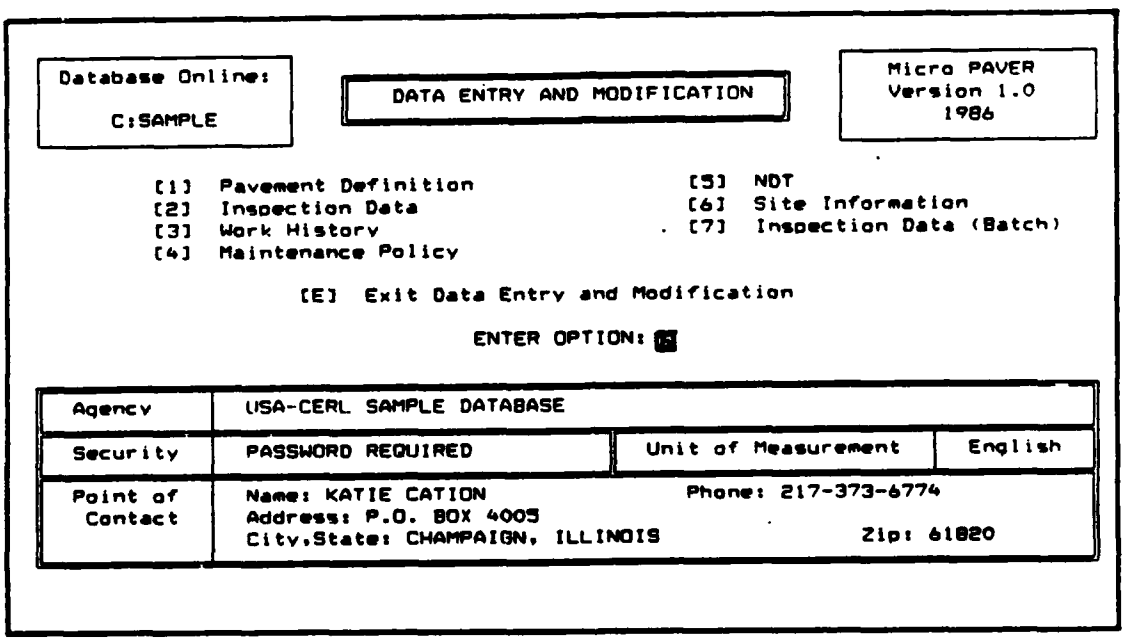
* Delete Information - Use the scrolling keys (↑ arrow or ↓ arrow) to highlight the test results you wish to delete. Use the F4 Delete key to remove it from the record. All information pertaining to that test will be deleted.

* Edit Information - Use the scrolling keys (↑ arrow or ↓ arrow) to highlight the record you wish to edit. Use the F5 Edit key to begin the edit procedures. Only the maximum deflection, basin area, DSM, and Load Transfer entries may be edited. Use the F10 Done key after all modifications have been performed.

* Select a Different Branch/Section - Use the F9 Next key to select a different section number for that particular branch number or to select a different branch.

Site Information

The Site Information option allows you to enter information concerning this particular database if this information was not entered when you created the database or if it needs to be changed. To access the Site Information option, select option 6, Site Information, from the Data Entry and Modification menu.



You will now have the option of setting a password for the database. By entering a password, access to your database will be restricted. Each time the database is accessed, the password must be entered exactly as it is entered the first time.

If you do not wish to set a password, enter only a carriage return or tab key. This will take you to the site information table described in the next step.

If you wish to set a password, enter a maximum of 8 alpha-numeric characters. You will then be asked whether you want to "Accept this as the password? (Yes or No)".

Enter: Y if you want to accept the password. The message "PASSWORD ACCEPTED" will appear on your screen. You will then be taken to the site information table as described in the next step.

N if you do not want to accept the password. No password will be set for the database and you will be taken to the site information table as described in the next step.



This password must be typed EXACTLY as shown before the Data Entry & Modification option can be selected for use.

Password: SECRET

Accept, [Y] yes or [N] no? Y

You will then be prompted to enter information in the site information table. Enter information according to the following guidelines:

a. Agency - The agency name is the name of the agency managing the pavements. The name may be up to 61 alpha-numeric characters.

b. Security - Any notes pertaining to the security placed on this database may be entered here. This may mean indicating that no security has been set or that a password is required. The description may be up to 23 alpha-numeric characters.

c. Unit of Management - Select whether your data will be entered in English or Metric units. The default selection is English. Enter E for English or M for Metric.

d. Name - Enter the name of a point of contact for questions concerning this database. The name may be up to 25 alpha-numeric characters.



e. Phone - Enter the phone number for the point of contact. You may enter up to 21 alpha-numeric characters.

f. Address - Enter the address for the point of contact. You may enter up to 52 alpha-numeric characters.

g. City, State - Enter the city and state for the point of contact. You may enter up to 30 alpha-numeric characters.

h. Zip - Enter the zip code for the point of contact. You may enter up to 10 alpha-numeric characters.

Agency	USA-CERL SAMPLE DATABASE		
Security	PASSWORD REQUIRED	Unit of Measurement	English
Point of Contact	Name: KATIE CATION/ EM DIVISION Phone: 217-373-6774 Address: P.O. BOX 4005 City,State: CHAMPAIGN, ILLINOIS Zip: 61820		

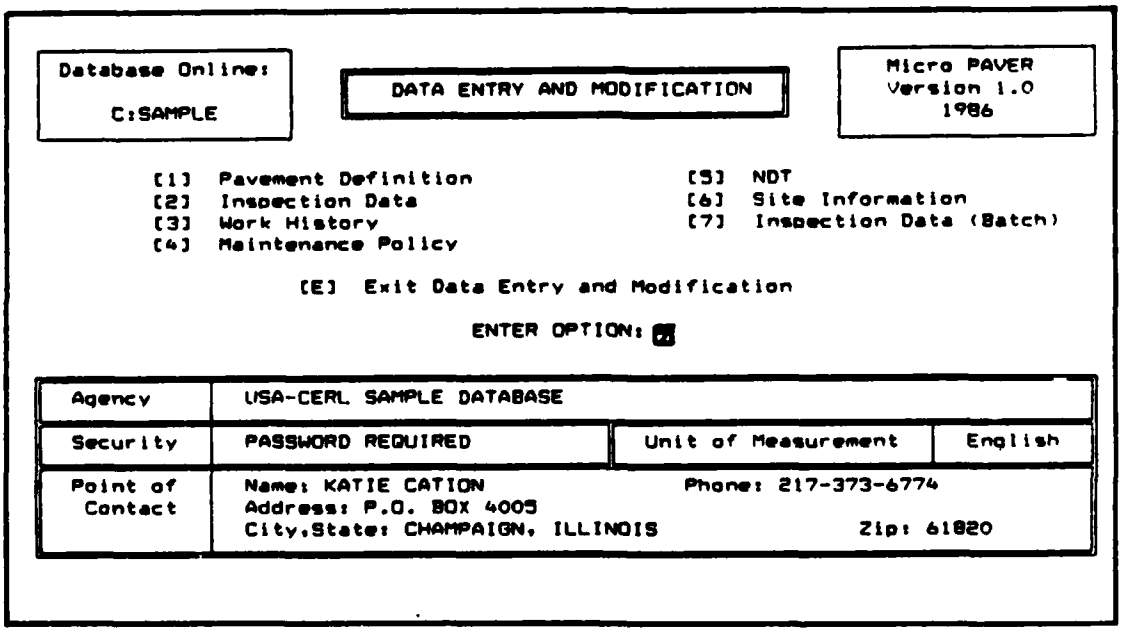


Inspection Data (Batch)

The Inspection Data (Batch) option allows the batch loading of a file containing inspection results into your Micro PAVER database. A file can be made in one of two ways: uploading a file obtained by using the Field Inspection Program developed for the Radio Shack TRS-80 Model 100 hand-held computer, or by manually preparing an external file according to a particular format. In both cases, a formatted file is produced which can be loaded through the Inspection Data (Batch) option. Preparing the formatted file is discussed in Chapter 8, Field Inspection Program. This section will discuss the loading of a file into your Micro PAVER database. To access the batch loading option select option 7, Inspection Data (Batch), from the Data Entry and Modification menu.

WARNING: If you have large amounts of inspection data to load into your Micro PAVER database, it is strongly recommended that you load only portions of the data at a time. Loading large amounts of data in one batch may overload the capabilities of this program.

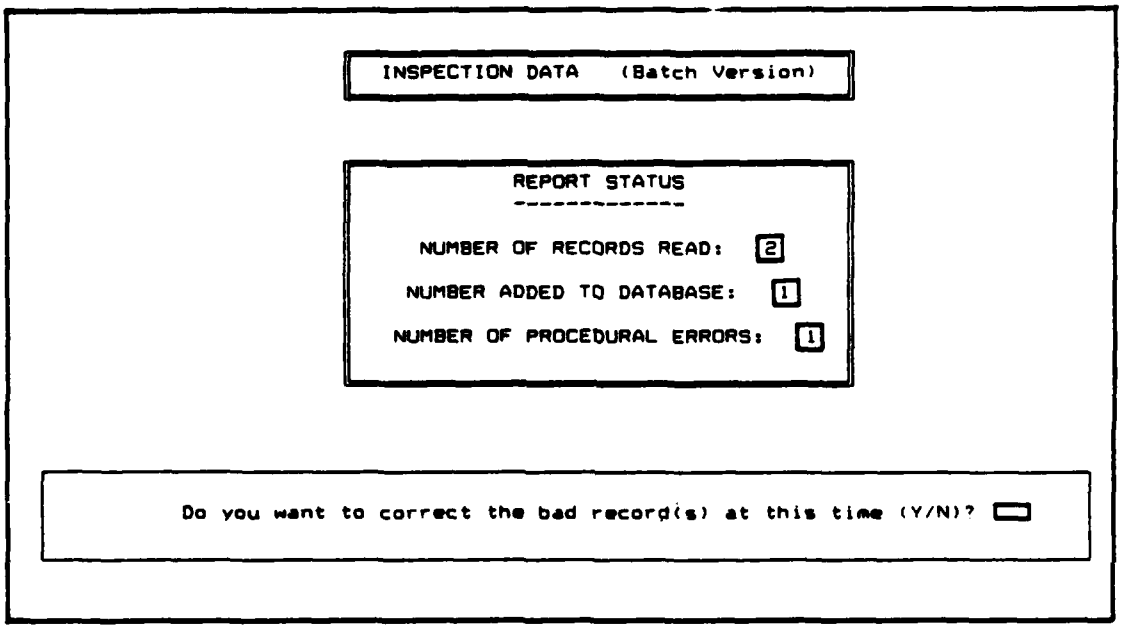
WARNING: Be sure that the appropriate database is online before selecting this option. The current online database is shown in the upper left hard corner of your screen. To select another database, access the Database Administration option.



You will be asked to enter the drive and file name of the file which contains the data you wish to upload. The file name can be a maximum of twelve characters.



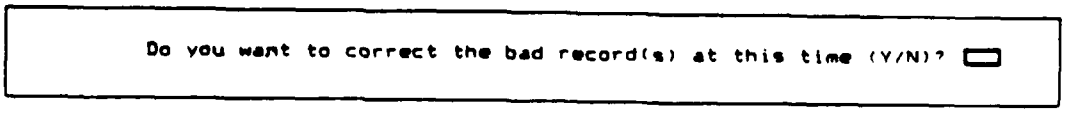
Once the file has been found a report status screen will appear on your terminal similar to the one shown below.



The report status indicates the number of records read, the number of records with no procedural errors which were added to your database, and the number of records which contained some form of procedural errors which could not be added to your database. Different procedures will be required of you depending on whether or not any procedural errors were found.

Procedural Errors Present

If any records were found to have procedural errors, you will receive the following prompt:



Select: N If you do not wish to correct the records at this time. You will be returned to the Data Entry and Modification menu. Any records that did not contain procedural errors will have been added to your database. Any uncorrected records will remain stored under the original file name.

Y If you do wish to correct your records. Each record containing an error will be shown sequentially. An error message identifying the problem with the record will be shown, and guidelines for correcting the problem will be given. Use the F10 Done key if you do not wish to or can not fix the error at this time. This procedure will continue until all bad records have been corrected or passed. After all bad records have been addressed once, a revised report status screen will appear on your terminal identifying the number of records read in this pass, the number of those added to the database, and the number of records which still contain procedural errors.

After each change in a record you will be asked to [A] Accept, [M] Modify, or [Q] Quit.

Select: A to Accept the change as entered. You will be prompted to correct any remaining records with procedural errors or you will be returned to the report status screen.

M to Modify any changes made. You will be prompted to re-enter any changes necessary. Your values will be retained until you change them.

Q to Quit making changes to that record. Your entries will be discarded and you will be taken to the next bad record or the record status screen if all records have been addressed.

The following is a list of the possible batch inspection error messages and probable explanations for those messages.

Invalid Branch Number

The branch number identified for this record has not been defined. Either this record must be assigned to an existing branch number, or the branch number must be defined under Pavement Definition.

Invalid Section Number

The section number identified for this record has not been defined. Either this record must be assigned to an existing section number, or this section number must be defined under Pavement Definition.

The Inspection Date Is Greater Than The System Date

The inspection date entered is later than the system date stored in the computer. If the inspection date is correct, enter today's date when you

first turn on the computer to update the system date. If the inspection date is not correct, you may correct it now.

No 07 Card Exists For An 08 Card

The entering of asphalt concrete inspection results is done in two parts: through an 07 card and an 08 card. The 07 card stores the branch number, section number, inspection date, any section condition ratings (Riding Quality, Safety, Drainage Condition, Shoulder Condition, Overall Condition, F.O.D.), and total number of sample units. This card must be defined before any inspection results can be uploaded.

No 10 Card Exists for an 11 Card

The entering of Portland Cement Concrete inspection results is done in two parts: through a 10 card and an 11 card. The 10 card stores the branch number, section number, inspection date, any section condition ratings (Riding Quality, Safety, Drainage Condition, Shoulder Condition, Overall Condition, F.O.D.), and total number of sample units. This card must be defined before any inspection results can be uploaded.

The Inspection Date Already Exists In The Database

The inspection date entered is the same as an inspection date already stored in your database. If the inspection date is right, you can override the existing record. If it is not correct, it must be changed.

The Sample Type Must Be An "A" or "R"

The only valid entries for type of sample unit are A for additional sample unit or R for random sample unit.

The Sample Size Must Be Greater Than Zero

A sample unit size must be entered. The sample unit size must not exceed the size of the section.

Invalid Distress Code

The distress code entered is not a valid one for your surface type and/or branch use. Valid distress codes for AC roads and streets are 1-19, PCC roads and streets 21-39, AC Airfields 41-56, and PCC Airfields 61-75.

Invalid Distress Severity Code

The distress severity code entered is not a valid one. Valid entries include L for low, M for medium, and H for high severity.

The Severity For This Distess Code Already Exists

The distress severity code entered for this distress code has already been defined. Multiple entries of the same distress type/severity are not allowed.

The Distress Quantity Must be Greater Than Zero

A distress quantity must be entered. The distress quantity must not exceed the sample unit size.

The Distress Quantity Exceeds The Sample Unit Size

The distress quantity entered is larger than the sample unit size. Either the distress quantity or the size of the sample unit must be changed.

No Procedural Errors Present

If no procedural errors were found in any of the records, or if all procedural errors have been corrected, you will be prompted to enter where you want the PCI Calculation report printed. Refer to the section of this chapter on Inspection Data for any help needed at this point.

It is important to realize that just because no procedural errors were identified, that does not mean that there are no errors present in your data-only that certain errors were not present. If, for example, a valid distress code of 17 (Slippage Cracking) was entered and it should have been a distress code of 18 (Swell), no error would have been identified. Only the validity of data can be checked.

Chapter 4

DATABASE RELATED REPORTS

This chapter will explain the generation of reports which access information stored in your database. The selection and sort criteria for those reports will be discussed and sample outputs will be included. The following reports will be covered:

* List Report
* Inventory Report
* PCI Report
* PCI Frequency Report
* Budget Planning Report
* Inspection Schedule Report
* Condition History Report
* M & R Report
* Network Maintenance Report

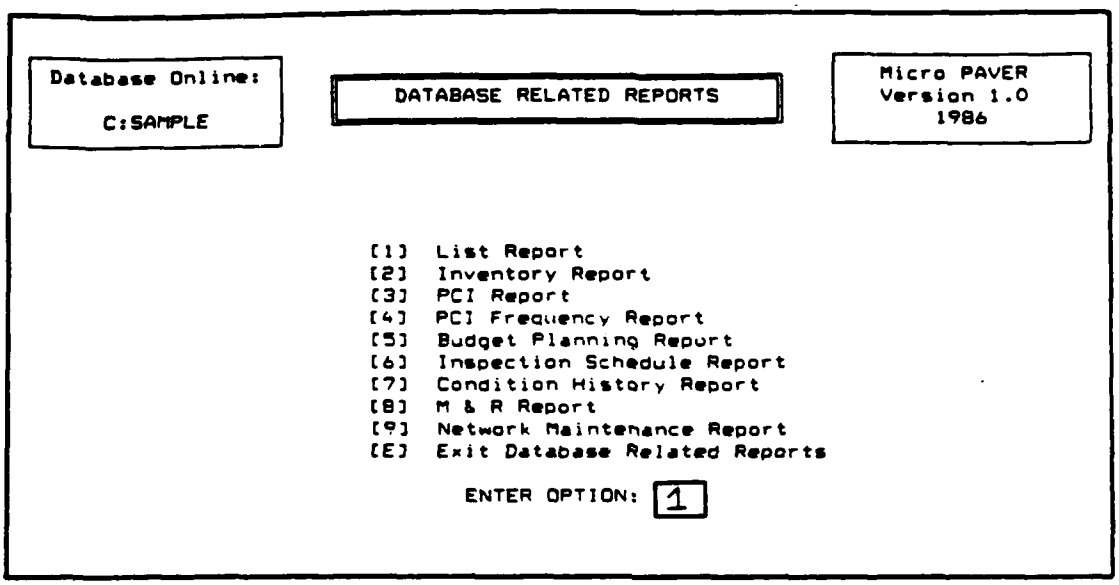
Database Related Reports are accessed by selecting option 2 from the main menu.

Selection/Sort Criteria

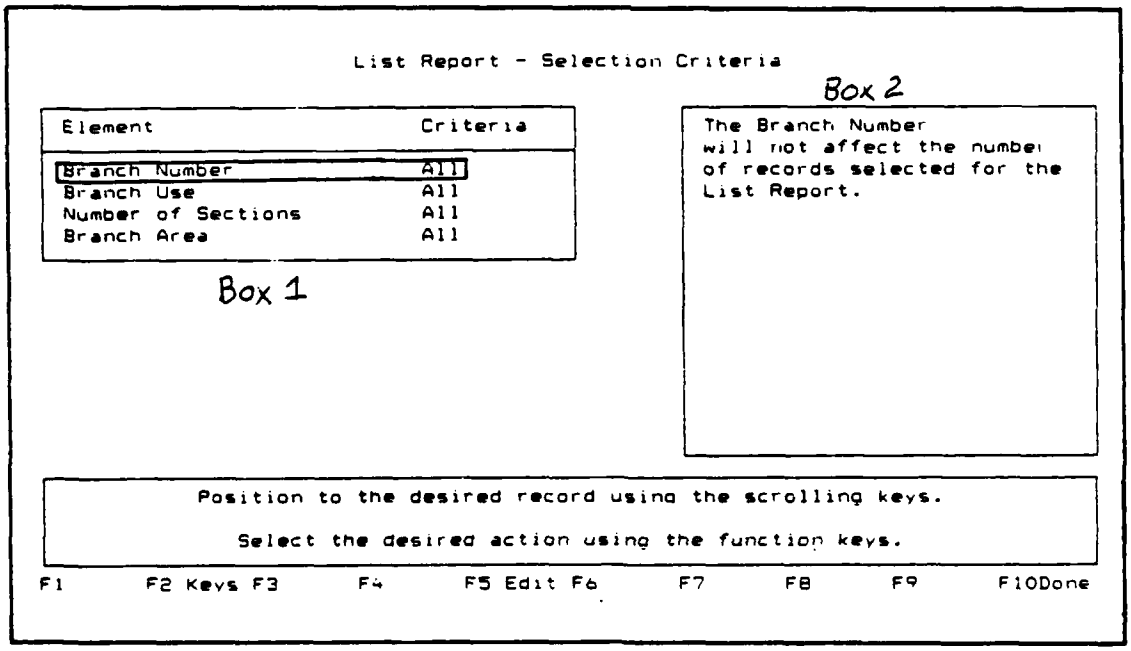
Many of the reports available utilize selection and sort criteria for selecting which elements will be included in the report and the order you desire these elements to be sorted in. The following examples are from the List Report. However, all selection and sort options work in the same way. These guidelines can be followed for the List, PCI, Inventory, PCI Frequency, Budget Planning, Inspection Schedule Report, and Network Maintenance Report.

Selection Criteria

After selecting the Database Related Reports option from the main menu, the following screen will appear:



Select the number corresponding to the report you want to process. Once a report number has been selected, the Selection Criteria Screen will appear. An example of a Selection Criteria screen from the List Report follows:



The elements listed in Box 1 are all items included in the report output. You have the option of selecting, for each element, which conditions you want to include in the report. The message appearing in Box 2 changes depending on the criteria selected. All information stored in the database pertaining to each of the elements will be included in the report unless you select different criteria which result in a customized report.

For each data element, you may select one of four criteria:

All - All information on that element that is stored in the database will be included in the report.

List - You may list which conditions you want included in the report.

Range - You may select a range of values to be included in the report.

Relational - You may choose values less than (<), less than or equal to (<=), greater than (>), or greater than or equal to (>=) another value.

The procedures involved in using the selection criteria are as follows:



1) Use the scrolling keys (↑ arrow key or ↓ arrow key) to highlight the data element in Box 1 that you wish to customize for the report.

2) Use the F5 Edit key to access the selection options. You may now select whether you want the report to contain all the values that are stored in the database for that particular data element, a selected list of the values, a range of values, or a relational function of some value. Select the number of the criteria you wish to select.

3) Enter the value desired for the criteria you have selected. Use the F1 Help key to list values stored in the database. Use the F10 Done key when you have finished defining your selection criteria for that data element.

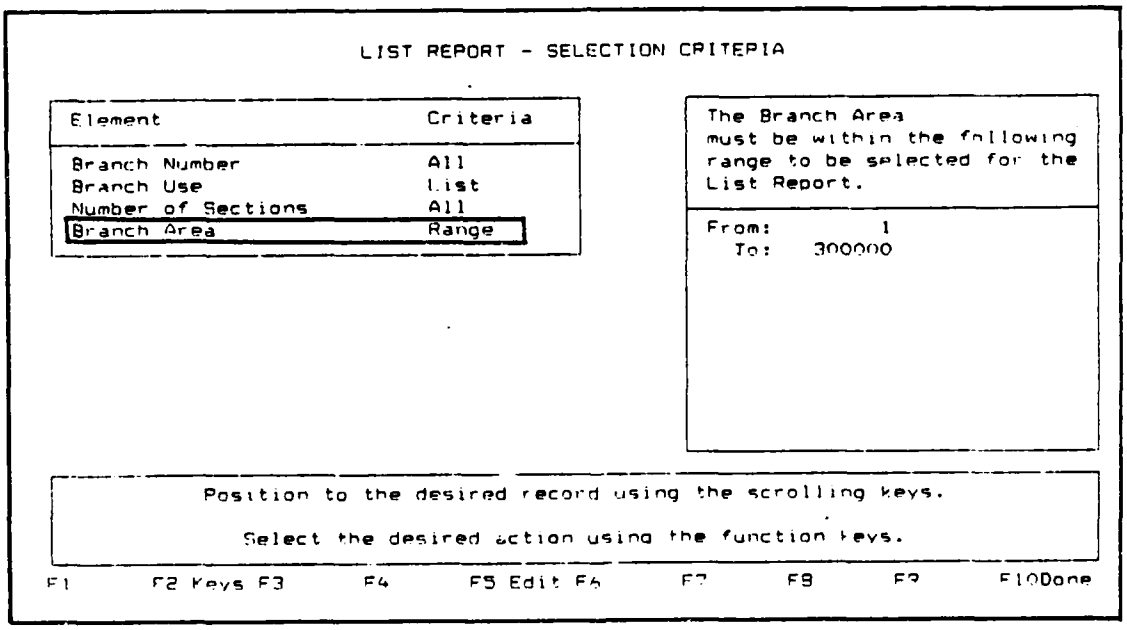
4) You will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit and discard the record.

Select: **A** to Accept the selection criteria as shown for that particular data element. You will then be allowed to define a selection criteria for another data element (Repeat steps 1-3). If no other selection criteria are to be defined, use the F10 Exit key to access the sort options.

M to Modify the selection criteria as shown. You will be prompted to choose another selection criteria.

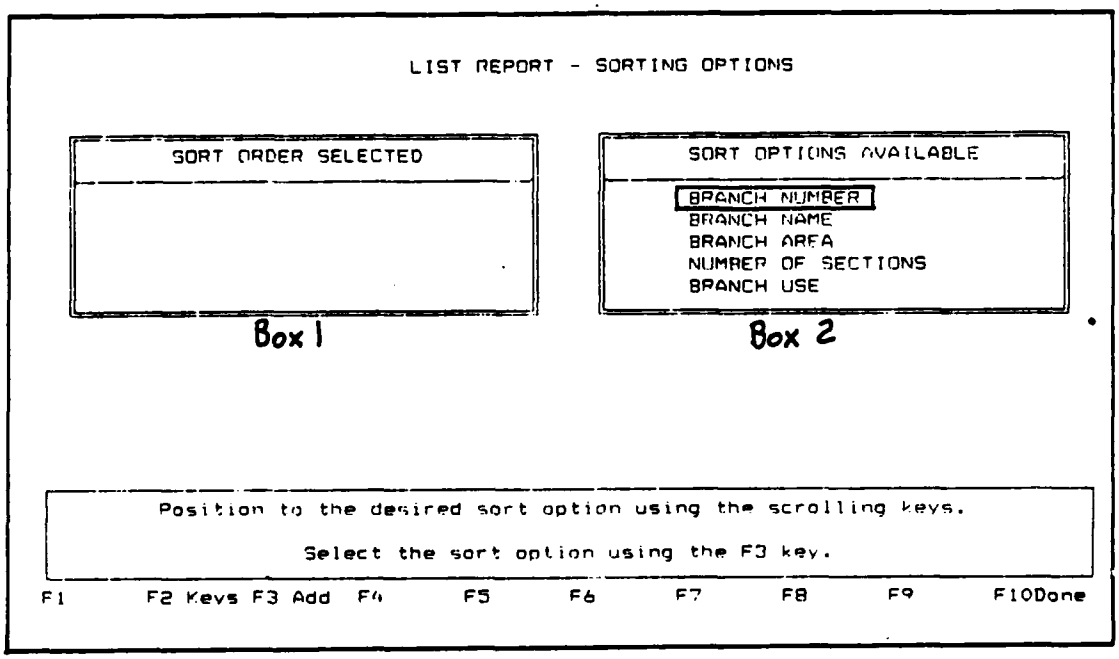
Q to Quit and discard the selection routine for this particular data element. The criteria will default back to its previous value. You may begin the selection procedure again by repeating steps 1-3.

After defining the selection criteria as desired, use the F10 Done key to exit the selection criteria portion of the report generation. You will once again have the option of Accepting, Modifying, or Quitting the procedure.



Sort Option

Once the selection criteria have been accepted, the sorting options must be selected. An example of a Sorting Option screen from the List Report follows:



The elements listed in Box 2 are those by which you may sort the report outputs. You may select which element is the most important and sort by that first. Other sorts may be selected within the initial sort until one of two conditions is met: 1) you no longer select sort orders, or 2) an eliminating sort option is selected (such as Branch number or Section number). With each sort you select, you will be able to sort in ascending or descending order. If no sort order is selected, the report will be sorted according to Branch and Section number.
The procedures involved in using the sort options are as follows:

1) Use the scrolling keys (↑ arrow key or ↓ arrow key) to highlight the data element in Box 2 by which you want to sort the report output by.

2) Use the F3 function key to select the highlighted data element as the sort option. The data element selected will move from Box 2 to Box 1 where the sort options selected will be listed in the order that the information will be sorted according to.

Note: Branch and Section numbers are eliminating sort options - no further sort options may be selected after either of these is selected. If no sort option is selected, the report will be sorted by Branch number.

3) After selecting a data element for the sort order, you will be asked whether you want that element sorted in ascending or descending order. In those cases where a data element contains both alpha and numeric character, the elements starting with numeric characters will be listed before elements starting with alphabetical characters in an ascending sort order.

Select: **A** to sort in Ascending order. This will mean sorting numerical values from low to high or alphabetical values from a to z.

D to sort in Descending order. This will mean sorting numerical values from high to low or alphabetical values from z to a.

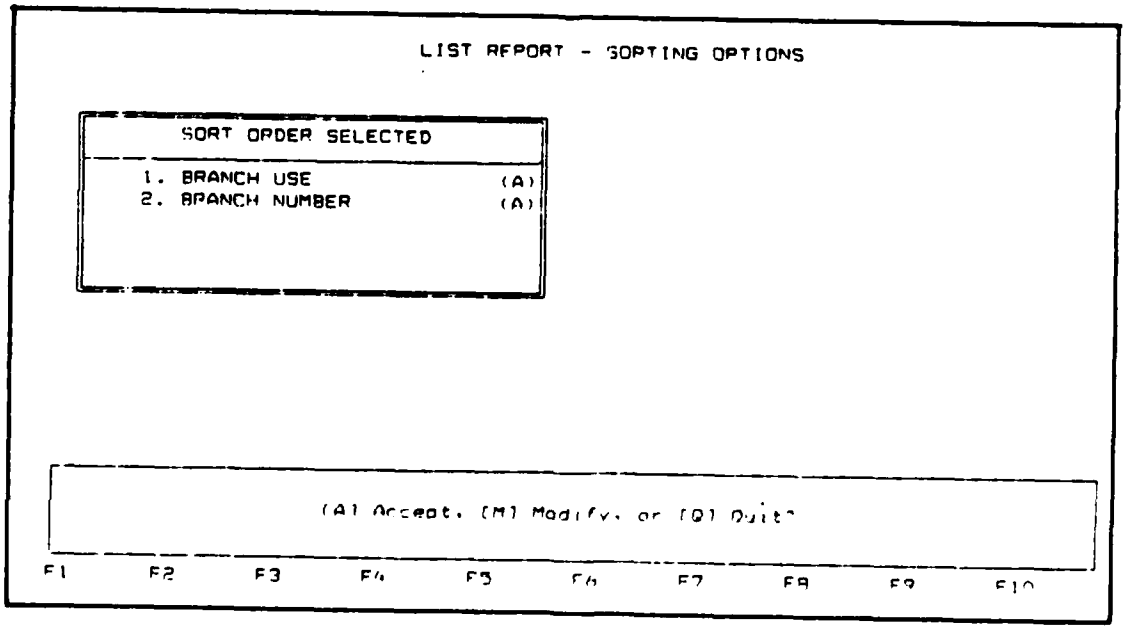
4) Repeat steps 1-3 for as detailed a sort as you feel is necessary or until an eliminating sort option has been selected (Branch or Section number). When you are finished selecting sort options, use the F10 Exit key to end the Sort Selection procedure.

5) You will then be shown the sort order that was selected and will be asked whether you want to [A] Accept or [M] Modify the sorting order, or [Q] Quit:

Select: **A** to Accept the sort order as shown. You will then be asked where you want to print the report. Printing the report will be discussed in the next section.

M to Modify the sort order selected. Your sort order will be discarded and you will be prompted to start the entire sort procedure again.

Q to Quit and discard the sort options. Your sort order will be discarded and you will be taken to the Database Related Reports menu.



Printing a Report

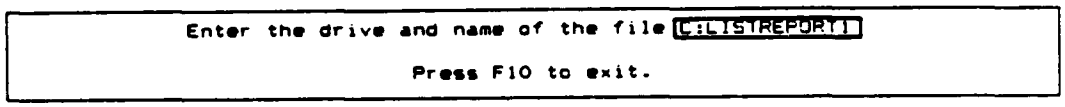
Once the sort order you selected has been approved, you will be ready to print the report. This may be done on your terminal screen, at a printer, or stored in a file.

You will receive a prompt asking where you want to send the report.

Select: T to print the report on your Terminal screen. After printing the report on your screen, you will receive the "Where do you want to send the report" prompt again. This enables you to preview the report on your screen before sending it to the printer.

P to print the report at a Printer. You will be asked to turn the printer on and position the paper to the top of the page. Strike any key to begin printing the report output. After your report has been printed, you will receive the "Where do you want to send the report" prompt again. This will enable you to store a report on a diskette if it is important enough.

F to store the report in a File. You will be asked to enter the drive and name of the file which will store the report. You will have 12 alphanumeric characters in which to identify the file name.



After the report has been copied onto the file, you will receive the "Where do you want to send the report" prompt again.

Q if you do not want to send the report, or have already sent the report to the location desired. You will be asked if you want to generate another report. By answering no, you will be returned to the Database Related Reports menu.

List Report

The List Report lists branch information stored in your database. The branch number, branch name, and number of sections in each branch are included in the output.

The List Report utilizes the selection criteria and sort options discussed in the previous sections of this chapter.

The following data elements are included in the selection criteria portion:

Element	Criteria
Branch Number	All
Branch Use	All
Number of Sections	All
Branch Area	All

The sort options available include:

SORT OPTIONS AVAILABLE
BRANCH NUMBER
BRANCH NAME
BRANCH AREA
NUMBER OF SECTIONS
BRANCH USE

Note: Branch number is an eliminating sort option - no further sort options may be selected after it is selected. If no sort option is selected, the report will be sorted by Branch number.

A sample output from the List Report follows:

BRANCH LISTING REPORT

REPORT DATE: SEP/22/1986

AGENCY NUMBER: USA-CERL

BRANCH NUMBER	BRANCH NAME	BRANCH USE	BRANCH AREA (SF)	NUMBER OF SECTIONS
TWS	TAXIWAY W-2	TAXIWAY	200000	3
R1230	RUNWAY 12-30	RUNWAY	500000	12
A2	SOUTH APRON	APRON	100000	3
1L19R	RUNWAY	RUNWAY	400000	9
		TOTALS	1200000	27

Inventory Report

The Inventory Report provides inventory information for the pavement sections stored in the database.

The Inventory Report utilizes only the selection criteria discussed in the previous sections of this chapter. It is sorted by Branch number.

The following data elements are included in the selection criteria portion.

Element	Criteria
Branch Number	All
Section Number	All
Branch Use	All
Surface Type	All
Pavement Rank	All
Zone	All
Section Category	All
Section Area	All

A sample output from the Inventory Report follows:

INVENTORY REPORT

AGENCY NUMBER:

REPORT DATE: AUG/27/1986

BRANCH NUMBER/USE/ NAME		SECTION NUMBER	SECTION CATEGORY	ZONE	PAVEMENT RANK	SURFACE TYPE	AREA SF
A2 / APRON / SOUTH APRON	FROM: A	AC	N	TO: C	PRIMARY	PCC	200000
					TOTAL AREA:		200000
MAPLE / ROADWAY/ MAPLE CT	FROM: LK PK RD	001		TO: END OF COURT	PRIMARY	PCC	5000
					TOTAL AREA:		5000
R1230 / RUNWAY / RUNWAY 12-30	FROM: SAMPLE UNIT 1	A1	N	TO: SAMPLE UNIT 22	PRIMARY	PCC	219500
	FROM: SAMPLE UNIT 23	B1	N	TO: SAMPLE UNIT 55	PRIMARY	PCC	219500
					TOTAL AREA:		439000
R1331 / RUNWAY / RUNWAY 13-31	FROM: B1	B1	N	TO: B43	PRIMARY	AC	175000
					TOTAL AREA:		175000
R1836 / RUNWAY / RUNWAY 18-36	FROM: 0	A1	A	TO: 1500	PRIMARY	PCC	225000
					TOTAL AREA:		325000

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PCI Report

The PCI report lists branch and section information for each branch/section combination included in the report. It also lists the last construction date, last inspection date, age, and PCI of the section.

The PCI Report utilizes the selection criteria and sort options discussed in the previous sections of this chapter.

The following data elements are included in the selection criteria portion:

Element	Criteria
Branch Number	All
Section Number	All
Branch Use	All
Surface Type	All
Pavement Rank	All
Zone	All
Section Category	All
Section Area	All
Last Construction Date	All
Last Inspection Date	All
PCI	All

The sort options available include:

SORT OPTIONS AVAILABLE
BRANCH & SECTION NUMBER
PCI
PAVEMENT RANK
SURFACE TYPE
ZONE
SECTION CATEGORY
INSPECTION DATE
BRANCH USE
LAST CONSTRUCTION DATE

Note: Branch and Section number and PCI are eliminating sort options - no further sort options may be selected after either one of them is selected. If no sort option is selected, the report will be sorted by Branch and Section number.

A sample output from the PCI Report follows:

PCI REPORT

REPORT DATE: AUG/27/1986

AGENCY NUMBER:

BRANCH NUMBER/USE/ NAME	SECTION NUM/RANK/SURF/AREA(SF)	LAST CONSTRUCT DATE	LAST INSPECTION DATE	PCI
A2 / APRON SOUTH APRON	AC / P / PCC / 200000 CAT: N ZONE:	SEP/30/1962 AGE (YRS):	SEP/30/1982 .0	100
MAPLE / ROADWAY MAPLE CT	001/ P / PCC / 5000 CAT: ZONE:	APR/30/1976 AGE (YRS):	MAY/19/1986 10.1	37
R1230 / RUNWAY RUNWAY 12-30	A1 / P / PCC / 219500 CAT: N ZONE:	SEP/30/1962 AGE (YRS):	JUL/11/1986 23.8	65
R1230 / RUNWAY RUNWAY 12-30	B1 / P / PCC / 219500 CAT: N ZONE:	SEP/30/1962 AGE (YRS):	SEP/30/1962 .0	100
R1331 / RUNWAY RUNWAY 13-31	B1 / P / AC / 175000 CAT: N ZONE:	JUN/15/1975 AGE (YRS):	JUN/15/1975 .0	100
R1536 / RUNWAY RUNWAY 18-36	A1 / P / PCC / 225000 CAT: A ZONE:	AUG/15/1972 AGE (YRS):	AUG/15/1972 .0	100

PCI Frequency Report

The PCI Frequency Report provides the user with an overall frequency of condition, based on PCI, for the year requested. This projected condition can be used to help plan future M & R and to inform management of the network condition. The PCI extrapolation used in this report presumes no major repairs have occurred between the last inspection and prediction dates. This allows the user to see the impact of performing no major repairs.

The PCI Frequency Report utilizes the selection criteria to determine which records will be selected for the output, and utilizes Report Options for determining which years the condition should be predicted for.

The following data elements are included in the selection criteria portion.

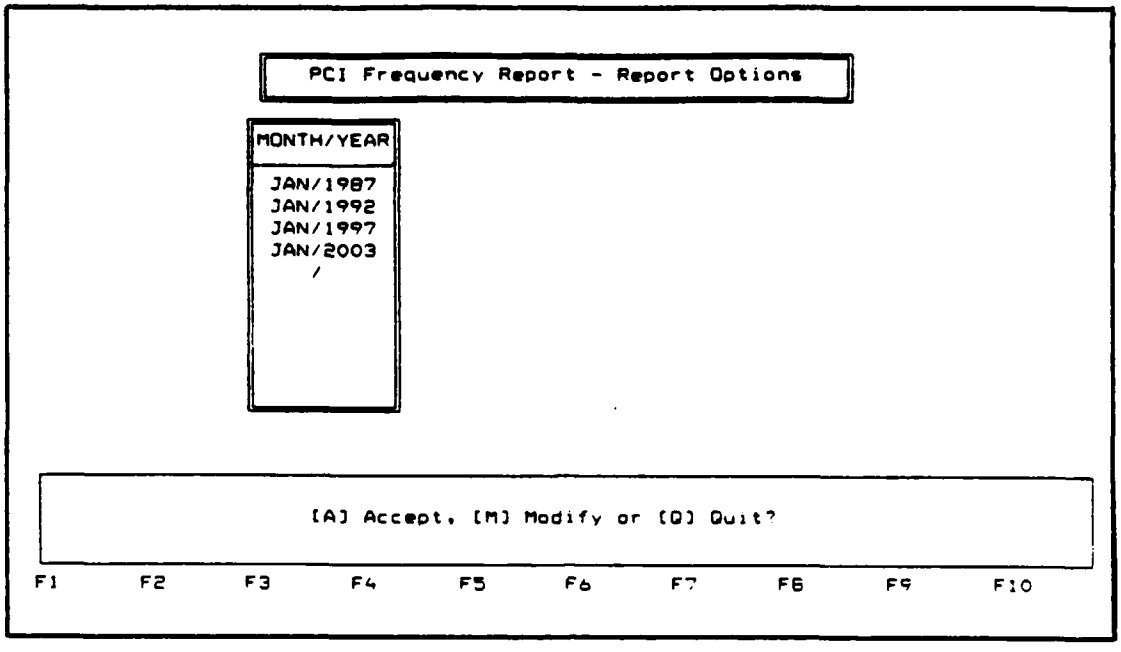
Element	Criteria
Branch Use	All
Pavement Rank	All
Surface Type	All
Zone	All
Section Category	All
Last Construction Date	All
PCI	All

Once the selection criteria have been accepted, you will be prompted to select the dates for which you want the condition predicted. Enter at least 1 and up to a maximum of 10 dates in the MMM/YYYY format. For example, enter July, 1990 as JUL/1990. The prediction date must be later than the system date. Use the F10 Exit key when you have finished entering prediction dates. You will be asked to [A] Accept, [M] Modify or [Q] Quit the prediction date entry.

Select: **A** to Accept the prediction dates as shown. You will then be asked to select a report option.

M to Modify the prediction dates shown. You will be allowed to modify the existing dates or add new ones.

Q to Quit the report generation process. You will be returned to the Database Related Reports menu.



After accepting the prediction dates, you will be asked to select which report options you would like to print. The following report options are available for the PCI Frequency Report:

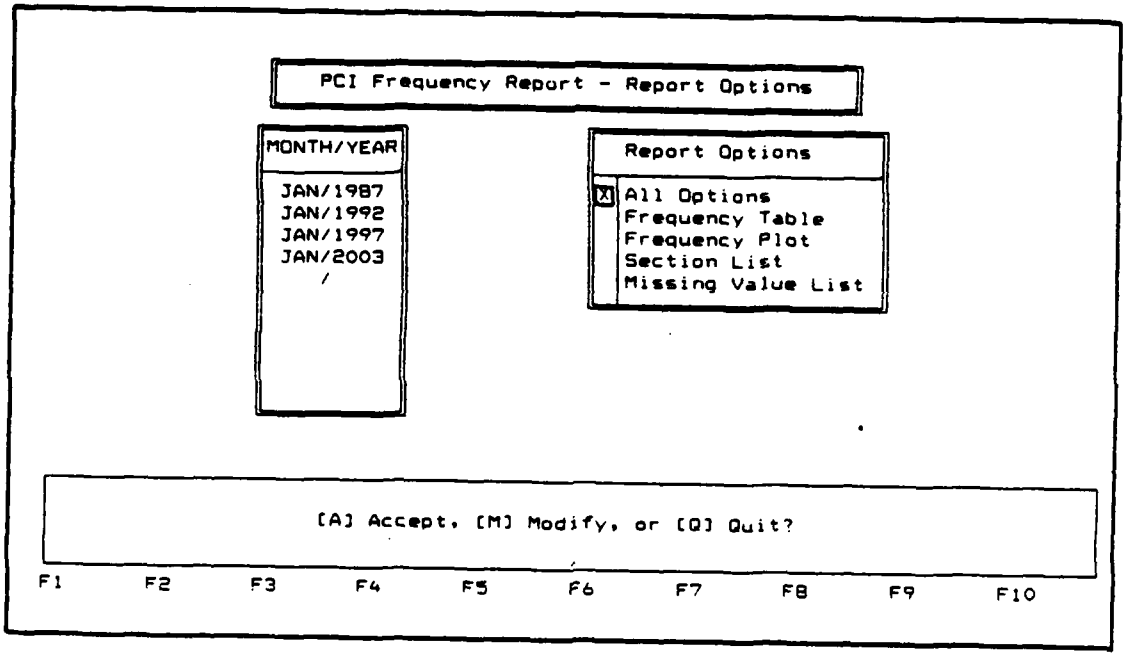
* All Reports
* Frequency Table
* Frequency Plot
* Section List
* Missing Value List

When the report option box appears on your screen, use the scrolling keys (↑ arrow or ↓ arrow) to highlight the report option you desire. Use the F3 Add key to accept that option. An "X" will appear next to the option you have selected. More than one option may be selected by repeating the procedure. The F4 Delete key will delete a choice previously selected. Use the F10 Exit key after your report options have been selected. You will then be asked to [A] Accept, [M] Modify, or [Q] Quit the report option selection.

Select: **A** to Accept the report options selected as shown. You will then be asked where you want to send the report. Follow the instructions at the beginning of the chapter on "Printing a Report".

M to Modify the report options selected. You may select new options or delete options previously selected.

Q to Quit the report process. You will be returned to the Database Related Reports menu.



A sample output from the PCI Frequency Report follows:

PCI FREQUENCY REPORT

Agency Name:

Report Date: OCT/06/1986

Branch Use	: All
Pavement Rank	: All
Surface Type	: All
Zone	: All
Section Category	: All
Last Construction Date	: All
PCI	: All

TABLE OF PCI FREQUENCY REPORT

YEAR: NOV 1990

CONDITION	PCI RANGE	NUMBER OF SECTIONS	% OF SECTIONS	TOTAL AREA	% OF AREA
FAILED	0 - 10	1	33.33	25000	33.33
VERY POOR	11 - 25	0	.00	0	.00
POOR	26 - 40	2	66.67	50000	66.67
FAIR	41 - 55	0	.00	0	.00
GOOD	56 - 70	0	.00	0	.00
VERY GOOD	71 - 85	0	.00	0	.00
EXCELLENT	86 - 100	0	.00	0	.00

TOTAL NUMBER OF SECTIONS:	3
AVERAGE PCI :	22
TOTAL SECTION AREA :	75000
NUMBER OF MISSING VALUES:	0

PCI FREQUENCY REPORT

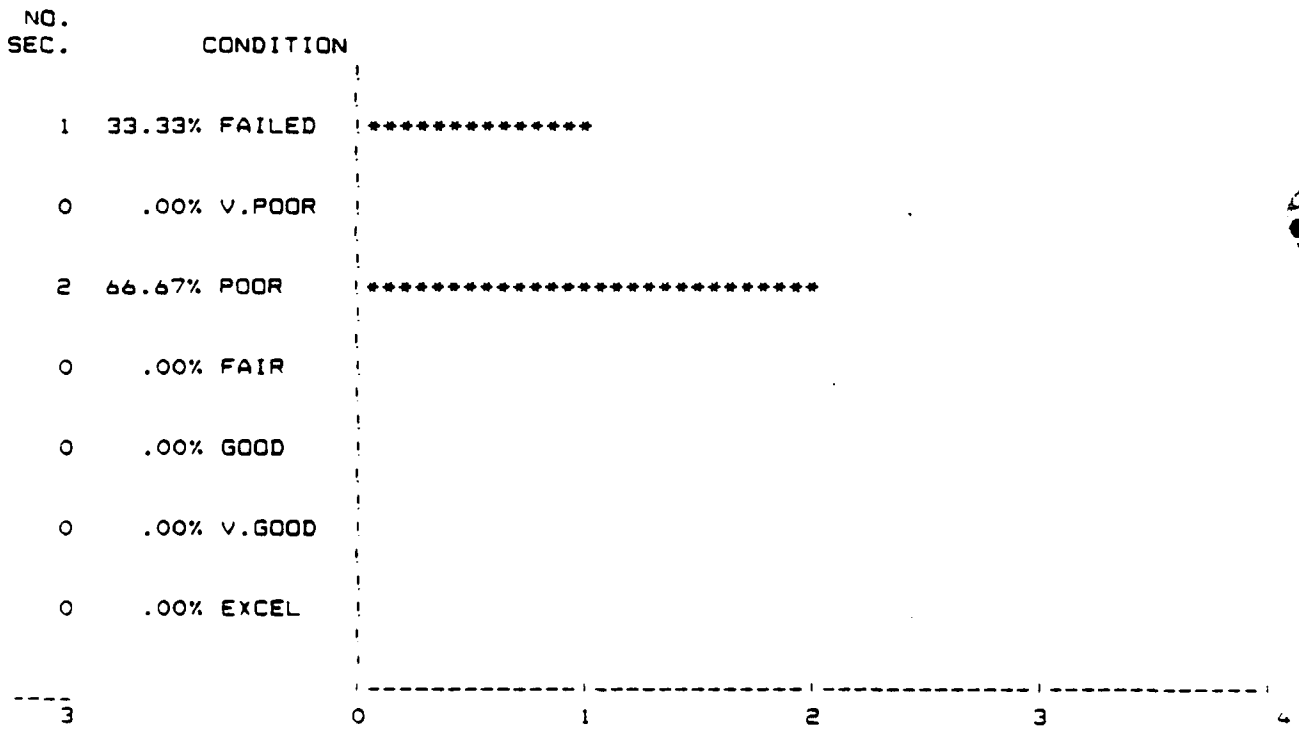
Agency Name:

Report Date: OCT/06/1986

Branch Use	: All
Pavement Rank	: All
Surface Type	: All
Zone	: All
Section Category	: All
Last Construction Date	: All
PCI	: All

PLOT OF PCI FREQUENCY REPORT

YEAR: NOV 1990



TOTAL NUMBER OF SECTIONS:	3
AVERAGE PCI :	22
NUMBER OF MISSING VALUES:	0

PCI FREQUENCY REPORT

Agency Name:

Report Date: OCT/06/1986

Branch Use : All
Pavement Rank : All
Surface Type : All
Zone : All
Section Category : All
Last Construction Date: All
PCI : All

SECTION LIST OF PCI FREQUENCY REPORT

YEAR: NOV 1990

BRANCH NUMBER/ USE / NAME	SECTION NUM /RANK/SURF/	AREA	LAST INSPECTION	LAST PCI	PRED PCI
R1231 / RUNWAY / RUNWAY 12-31	B1 / P / PCC/	25000	SEP/30/1980	68	0
R1231 / RUNWAY / RUNWAY 12-31	A1 / P / PCC/	25000	SEP/30/1985	55	29
R1231 / RUNWAY / RUNWAY 12-31	C1 / P / PCC/	25000	SEP/30/1984	65	38

TOTAL NUMBER OF SECTIONS: 3
AVERAGE PCI : 22
NUMBER OF MISSING VALUES: 0

Budget Planning Report

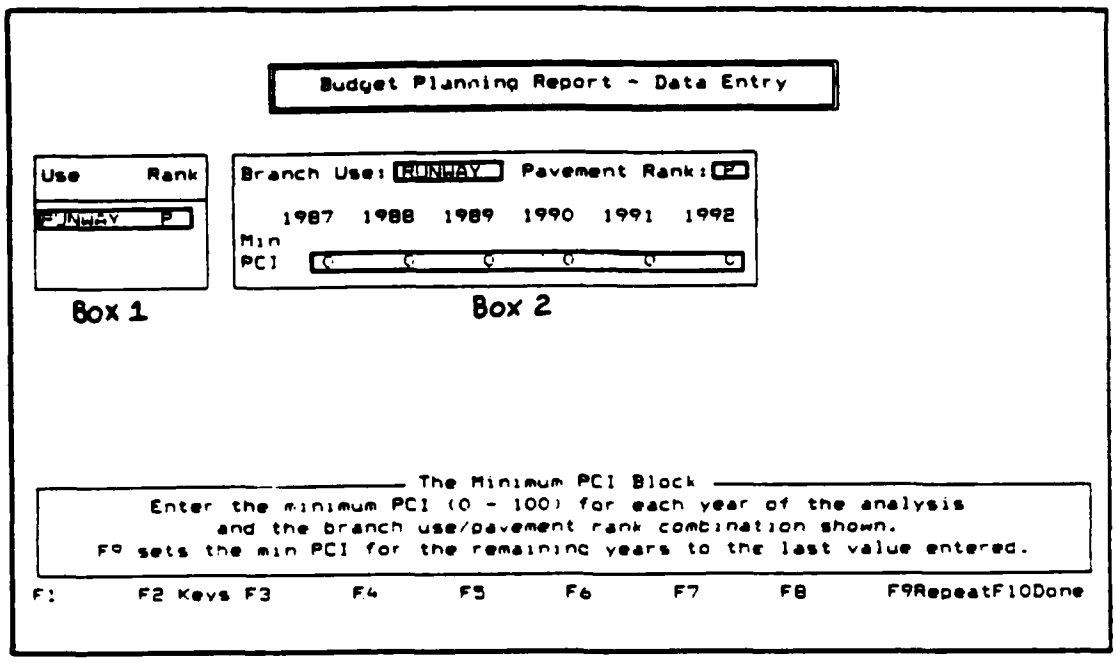
The Budget Planning Report is useful for providing the user with a five-year budget plan estimating the annual rehabilitation dollars required to maintain pavements above a given condition level. The user inputs minimum PCI levels for various Branch Uses and Pavement Ranks, unit repair costs based on pavement Surface Type and the PCI scale, and an inflation rate. Therefore, the user can see the effects that various minimum condition levels have on the budget.

The Budget Planning Report utilizes the selection criteria to determine which records will be selected for the output, but also requires some data entry. You will be asked to enter the minimum PCI acceptable for a particular branch use/pavement rank combination, repair costs for various PCI ranges, inflation rate, and the report options desired.

Follow the instructions at the beginning of the chapter for instructions on how to use the selection criteria. The following data elements are included in the selection criteria portion:

Element	Criteria
Branch Use	All
Pavement Rank	All
Surface Type	All
Zone	All
Section Category	All
Last Construction Date	All
PCI	All

Once the selection criteria have been chosen, you will be asked to enter the minimum PCI (0-100) you will allow your pavements to deteriorate to prior to repair for each year in the analysis. Minimum PCI data must be entered for each branch use/pavement rank combination chosen in the selection criteria portion of the report generation.



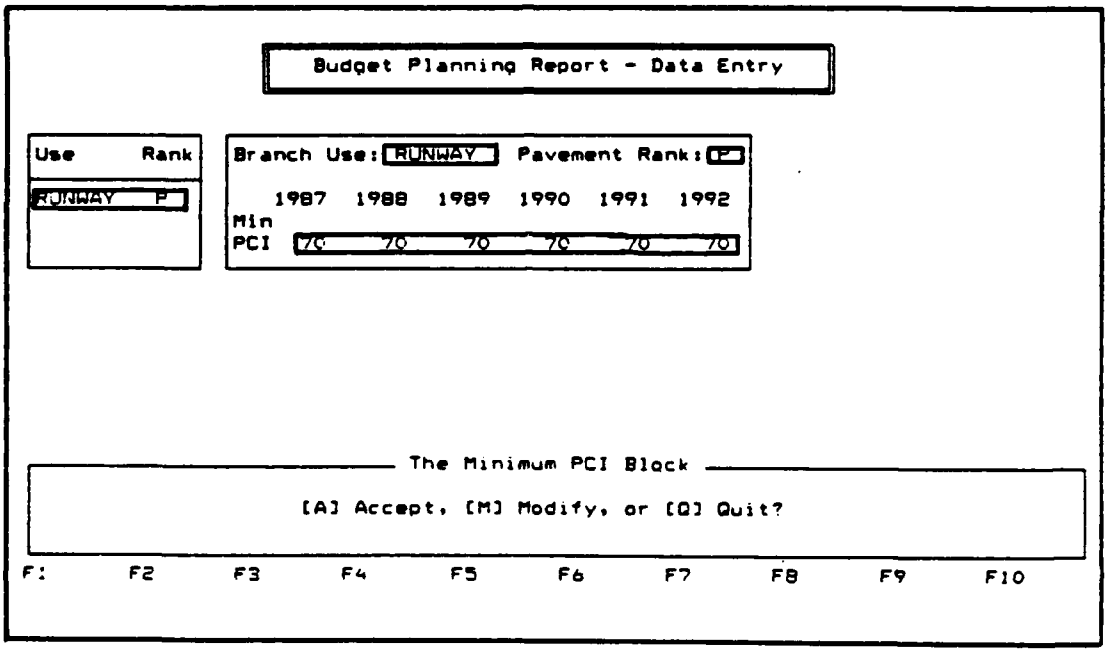
For the highlighted branch use/pavement rank combination shown in Box 1 and defined at the top of Box 2, enter the minimum PCI you will allow your pavements to deteriorate to for each of the 6 years in the analysis period. The F9 Repeat key can be used to set the minimum PCI for the remaining years to the last value entered. For example, using the F9 Repeat key after entering a minimum PCI of 70 for the first year in the analysis will set the minimum PCI for the remaining five years at 70.

You will be asked to [A] Accept, [M] Modify, or [Q] Quit after each branch use/pavement rank combination.

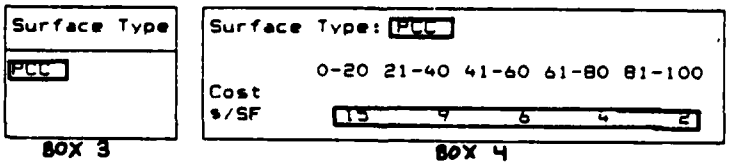
Select: **A** to Accept the minimum PCI values shown for the highlighted branch use/pavement rank combination. If more branch use/pavement rank combinations were chosen in the Selection criteria, you will be prompted to enter the minimum PCI's for the new branch use/pavement rank combination. Once minimum PCI values have been entered for all branch use/pavement combinations, you will be prompted to enter repair costs as discussed in the next section.

M to Modify the values shown. Your current values will be retained until you modify them.

Q to Quit the minimum PCI block for that branch use/pavement rank combination. Your values will be deleted and reset to 0. You will be returned to the Database Related Reports menu.



After minimum PCI values for all branch use/pavement rank combinations have been entered, you will be prompted to enter repair costs for five PCI ranges for each surface type chosen in the Selection criteria portion of report generation.



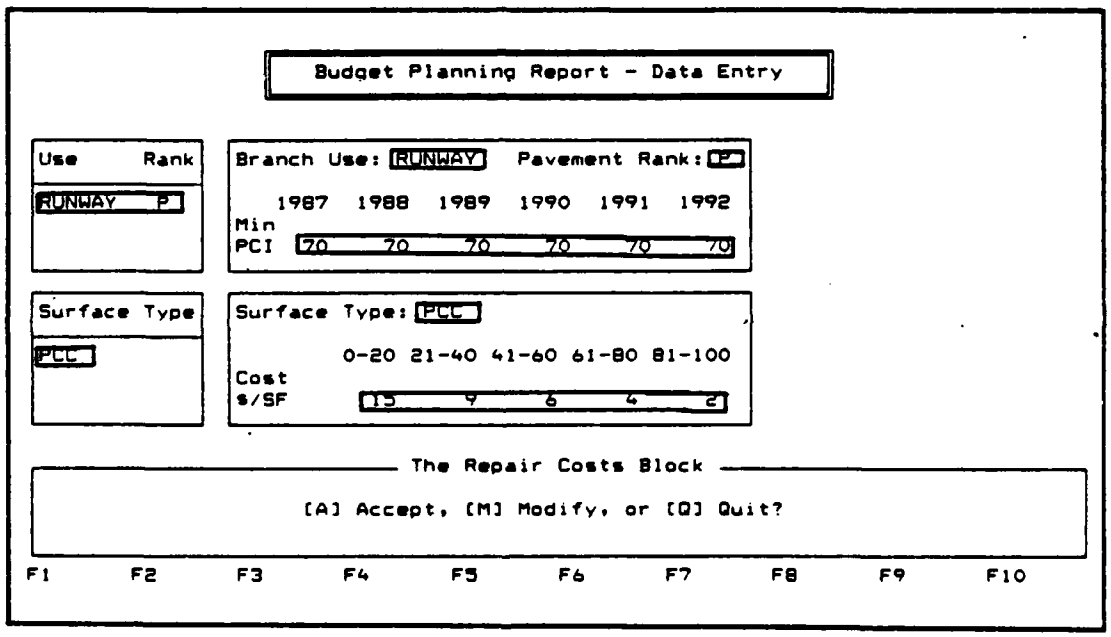
For the highlighted surface type shown in Box 3, enter the cost in dollars per square foot in Box 4 for each of the five PCI ranges: 0-20, 21-40, 41-60, 61-80, and 81-100. All repair costs must be less than $100.00 per square foot. Decimals are allowed.

You will be asked to [A] Accept, [M] Modify, or [Q] Quit after each surface type chosen in the Selection criteria.

Select: A to Accept the costs as shown for the highlighted surface type. If more surface types were chosen in the Selection criteria portion of the report generation, you will be prompted to enter repair costs for the new surface type. After repair costs have been entered for all surface types selected, you will be prompted to enter the inflation rate as discussed in the next section.

M to Modify the values shown. Your costs will be retained until you modify them.

Q to Quit the repair cost block for that surface type. Your costs will be deleted and reset to 0. You will be taken to the Database Related Reports menu.



The next input requested for the Budget Planning Report is the Inflation Rate. Enter a rate less than 100. Decimals are allowed. Once a value has been entered, you will be asked to [A] Accept, [M] Modify or [Q] Quit.

Select: A to Accept the Inflation Rate shown. You will then be prompted to select report options.

M to Modify the inflation rate shown. You will be able to enter a different value. The previously entered value will be retained until you change it.

Q to leave the Inflation Rate portion of the program your inflation rate will be discarded and you will be taken to the Database Related Reports menu.

After completing the inflation rate block of the Budget Planning Report you will be asked to select which report options you would like printed. The following report options are available for the Budget Planning Report:

* All Options
* Budget Table
* Budget Plot
* Section List
* Missing Value List

When the report option block appears on your screen use the scrolling keys (↑ arrow or ↓ arrow) to highlight the report option you desire. Use the F3 Add key to accept that option. An "X" will appear next to the option you've selected. More than one option may be selected by repeating the procedure. The F4 Delete key will delete a choice previously selected. Use the scrolling keys to highlight the report option you want to delete. Use the F10 Exit key after your report options have been selected. You will then be asked to [A] Accept, [M] Modify, or [Q] Quit the report option selection procedure.

Select: **A** to Accept the report options selected as shown. You will then be asked whether you want to accept your data entered. Follow the instructions in the next section.

M to Modify the report options you selected. Previously selected options will be retained until you change them.

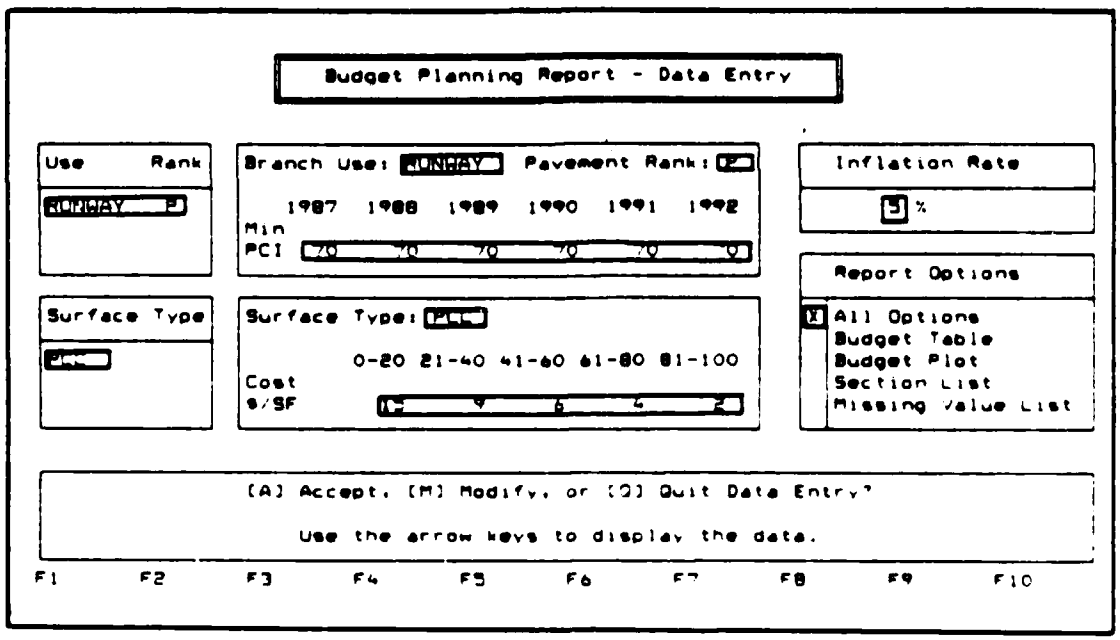
Q to leave the report option block. At least one report option must be selected before Q can be used. You will be taken to the Database Related Reports menu.

After accepting your report options, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit Data Entry. The arrow keys can be used to scroll through the information entered in the Minimum PCI and Repair Costs blocks of the report to review the inputs that you made.

Select: **A** to Accept the data entered as shown. You will then be asked where you want to send the report. Follow the instructions at the beginning of the chapter on "Printing a Report."

M to Modify data previously entered. You will be asked which block you want to modify - the Minimum PCI block, Repair Costs block, Inflation Rate block, or the Report Options block. Select the block you wish to modify, and follow the procedures discussed previously for entering data.

Q to Quit the data entry portion of the report. Your previously entered data will be deleted and you will be taken to the Database Related Reports menu.



A sample output from the Budget Planning Report follows.

Budget Planning Report

Agency Name:
Report Date: AUG/27/1986

Branch Use : All
Pavement Rank : All
Surface Type : All
Zone : All
Section Category : All
Inflation Rate : 5.00 %

Table of Budget Planning Report
(Costs in thousands of dollars)

Pavement Rank	Year to Repair 1987	1988	1989	1990	1991	1992
Primary	7079.45	.00	.00	.00	.00	.00
Total Cost	7079.45	.00	.00	.00	.00	.00

Total Number of Sections Repaired : 6
Total Number of Sections Not Needing Repair : 0
Total Number of Missing Values : 0

Plot of Budget Planning Report

Cost of Repair | Year to Repair

7079.45 | 1987 | **********

.00 | 1988 |

.00 | 1989 |

.00 | 1990 |

.00 | 1991 |

.00 | 1992 |

7079.45 (1770 3540 5310

Cost in Thousands

Total Number of Sections Repaired : 6
Total Number of Sections Not Needing Repair : 0
Total Number of Missing Values : 0

Section List of Budget Planning Report
(Costs in thousands of dollars)

Year to Repair	Branch Num / Use	Section Num / Rank / Surf	Pred PCI	$/SF	Section Area (SF)	Cost ($1000's)
1987	A2 / APRON	AC / P / PCC	27	9.90	300000	1[illegible]
1987	MAPLE / ROADWAY	001 / P / PCC	34	8.40	5000	[illegible]
1987	R1230 / RUNWAY	A1 / P / PCC	58	4.20	219500	[illegible]
1987	R1230 / RUNWAY	B1 / P / PCC	27	9.90	319500	[illegible]
1987	R1331 / RUNWAY	B1 / P / AC	56	4.40	175000	[illegible]
1987	R1836 / RUNWAY	A1 / P / PCC	57	5.30	225000	[illegible]

Total Number of Sections Repaired : 6
Total Number of Sections Not Needing Repair: 0
Total Number of Missing Values : 0

Missing Value List of Budget Planning Report

Branch Number	Section Number

Summary of Data for the Budget Planning Report

Minimum PCI Table

Branch Use	Pavement Rank	Year of Repair 1987	1988	1989	1990	1991	1992
APRON	P	70	70	70	70	70	70
ROADWAY	P	70	70	70	70	70	70
RUNWAY	P	70	70	70	70	70	70

Unit Repair Cost Table
(Cost in $/SF)

Surface Type	0-20	21-40	41-60	61-80	81-100
AC	15.00	9.00	6.00	4.00	2.00
PCC	15.00	9.00	6.00	4.00	2.00

Inspection Schedule Report

The Inspection Schedule Report is useful for preparing a five-year plan of the pavement sections to be surveyed each year. The schedule is based on two criteria. One is the minimum PCI a given pavement type is allowed to reach before inspection; the second is the rate of deterioration (loss of PCI points per year). Both the minimum PCI values and the allowed years between inspections for various deterioration rates are input by the user.

The Inspection Schedule Report utilizes the selection criteria to determine which records will be selected for the output, but also requires some data entry. You will be asked to enter the minimum PCI below which the pavement should be inspected for various branch use/pavement rank combinations, the maximum number of years between inspections for various rates of deterioration, and the report options desired.

Follow the instructions at the beginning of the chapter for instructions on how to use the selection criteria. The following data elements are included in the selection criteria portion:

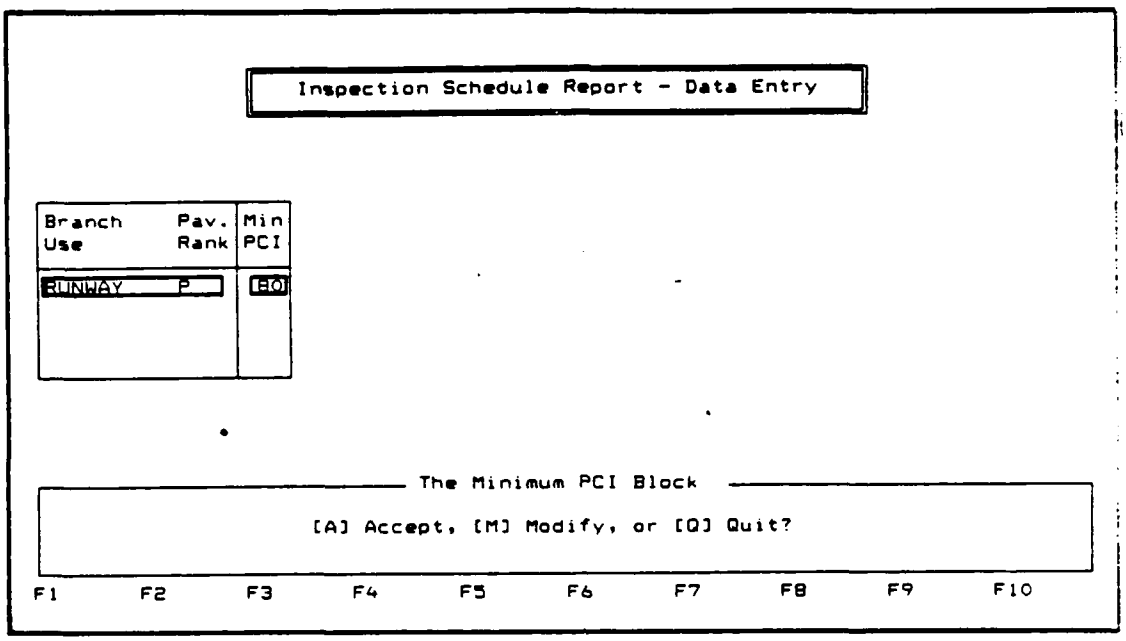
Element	Criteria
Branch Use	All
Pavement Rank	All
Surface Type	All
Zone	All
Section Category	All
Last Construction Date	All
PCI	All

Once the selection criteria have been chosen, you will be asked to enter the minimum PCI (0-100) below which your pavements should be inspected. Minimum PCI data must be entered for each branch use/pavement rank combination previously chosen in the selection criteria portion of the report generation. After entering a value for each branch use/pavement rank combination, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit.

Select: **A** to Accept the minimum PCI entered. You will then be prompted to enter a value for the next branch use/pavement rank combination or, if all combinations have been considered, you will be prompted to enter the maximum number of years you want between inspections as discussed in the next section.

M to Modify the minimum PCI value entered. You will be allowed to change the value previously entered. The minimum PCI value will be retained until you change it.

Q to Quit entering a minimum PCI for that branch use/pavement rank combinations. Previously entered data will be discarded. You will be taken to the Database Related Reports menu.

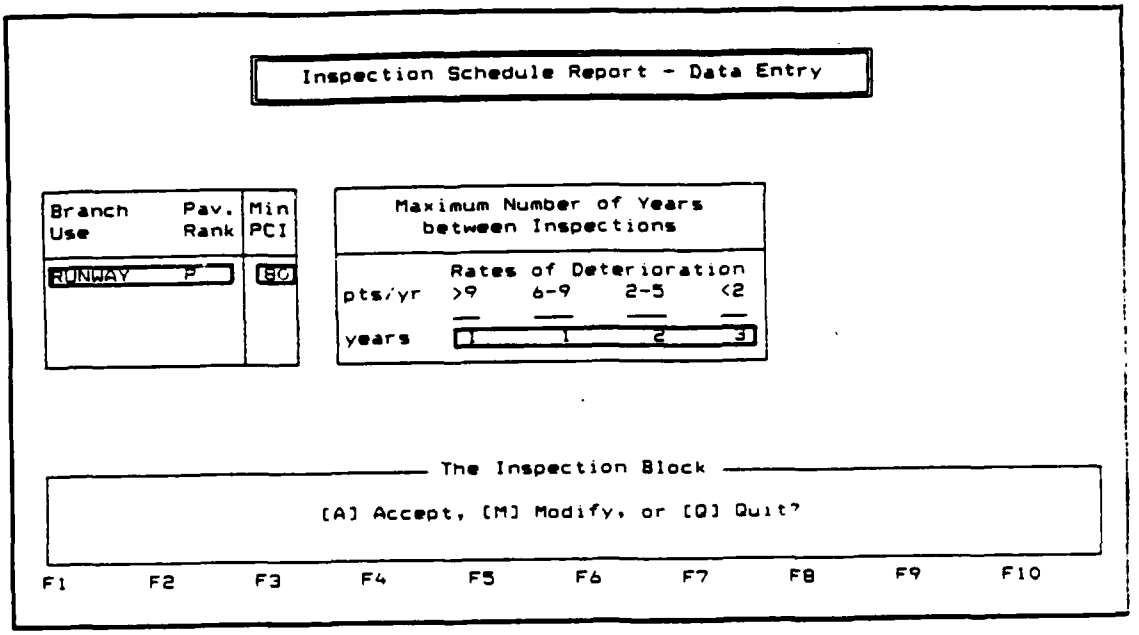


After all branch use/pavement rank combinations have been considered, you will be prompted to enter the maximum number of years between inspections that you desire for four different pavement deterioration rates: a drop of PCI points per year greater than 9, between 6 and 9, between 2 and 5, and less than 2 points per year. A maximum value of 99 years is allowed to be entered between inspections. After entering your values, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit.

Select: **A** to Accept the data entered in the inspection block. You will then be prompted to select the report options you desire as discussed in the next section.

M to Modify the values you entered. You will be allowed to modify any of the values previously entered. Use the carriage return to skip over values you do not want to change and the F10 Done key after completing the modifications. The values previously entered will be retained until they are changed.

Q to Quit the inspection block. Previously entered values will be discarded and you will be taken to the Database Related Report menu.



After completing the Inspection Block, you will be asked to select which report options you would like printed. The following report options are available for the Inspection Schedule Report:

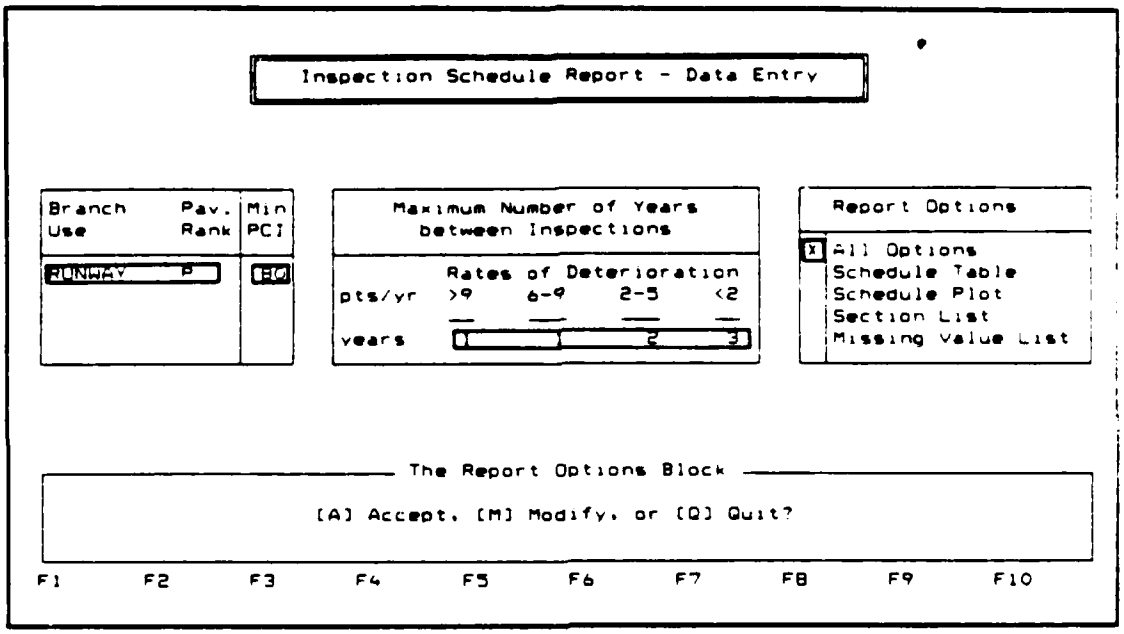
* All Options
* Schedule Table
* Schedule Plot
* Section List
* Missing Value List

When the report option block appears on your screen, use the scrolling keys (↑ arrow or ↓ arrow) to highlight the report option you desire. Use the F3 Add key to Accept that option. An "X" will appear next to the option you have selected. More than one option may be selected by repeating the procedure. The F4 Delete key will delete a choice previously selected. Use the scrolling keys to highlight the report option you want to delete. Use the F10 Exit key after your report option selection is completed. You will then be asked to [A] Accept, [M] Modify, or [Q] Qu t the report option selection procedure.

Select: **A** to Accept the report options selected as shown. You will then be asked whether you want to Accept, Modify, or Quit data entry. Follow the instructions in the next section.

M to Modify the report options you selected. Previously selected options will be retained until you change them.

Q to leave the report option block. At least one report option must be selected for Q to be valid. You will be taken to the Database Related Report menu.



After accepting your report options, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit Data Entry. The arrow keys can be used to scroll through the information entered in the Minimum PCI block of the report.

Select: **A** to Accept the data entered as shown. You will then be asked where you want the report sent. Follow the instructions at the beginning of the chapter on "Printing a Report."

M to Modify data previously entered. You will be asked which block you want to modify - the Minimum PCI block, Inspection block, or the Report Options block. Select the block you wish to modify, and follow the procedures discussed previously for entering data.

Q to Quit the data entry portion of the report. Your previously entered data will be deleted and you will be taken to the Database Related Reports menu where you can repeat the entire procedure if desired.

A sample output from the Inspection Schedule Report follows.

Inspection Schedule Report

Agency Name: USA-CERL
Report Date: SEP/22/1986

Branch Use	: All
Pavement Rank	: All
Surface Type	: All
Zone	: All
Section Category	: All
Last Construction Date	: All
PCI	: All

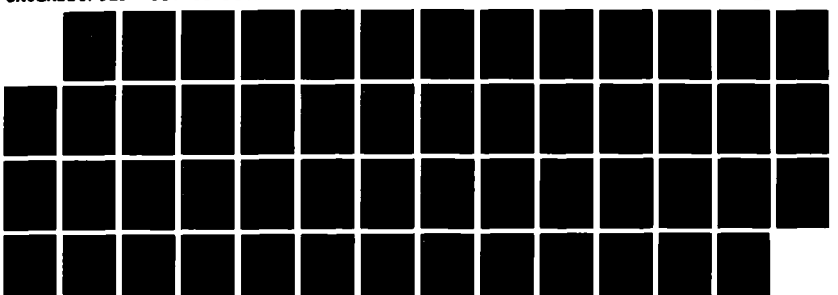
Table of Inspection Schedule Report

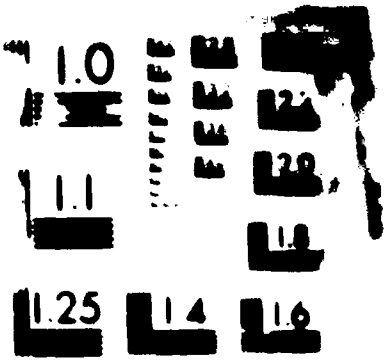
Pavement Rank	Year to Inspect 1987	1988	1989	1990	1991	1992
Primary	19	0	0	0	0	0
Total Sections to Inspect	19	0	0	0	0	

Total Number of Sections to Inspect	: 19
Total Number of Sections Not Needing Inspection	: 0
Total Number of Missing Values	: 0

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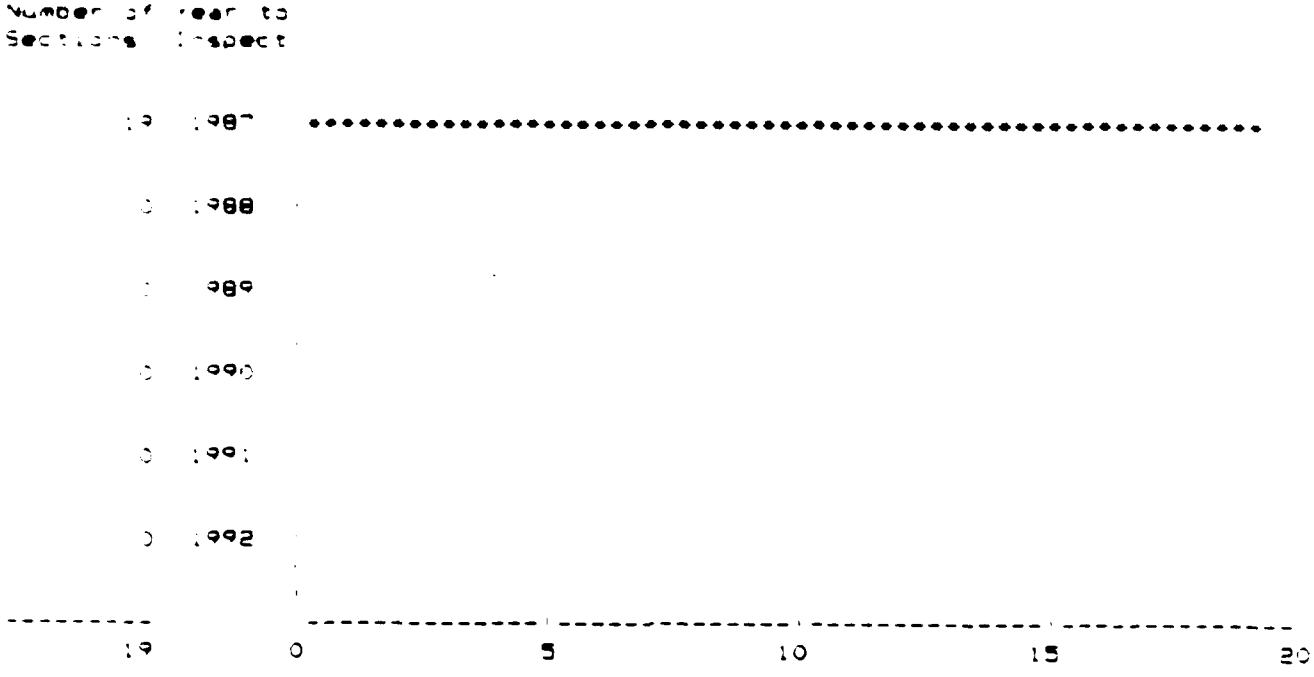

1.0
1.1
1.25
1.4
1.6

Inspection Schedule Report

Agency Name: USA-CERL
Report Date: SEP 22/1988

Branch Use	: All
Pavement Rank	: All
Surface Type	: All
Zone	: All
Section Category	: All
Last Construction Date	: All
PCI	: All

Plot of Inspection Schedule Report



Total Number of Sections to Inspect	: 19
Total Number of Sections Not Needing Inspection	: 0
Total Number of Missing Values	: 0

Inspection Schedule Report

Agency Name: USA-CERL
Report Date: SEP/22/1986

Branch Use : All
Pavement Rank : All
Surface Type : All
Zone : All
Section Category : All
Last Construction Date: All
PCI : All

Missing Value List of Inspection Schedule Report

Branch Number	Section Number

Inspection Schedule Report

Agency Name: USA-CERL
Report Date: SEP/22/1986

Branch Use : All
Pavement Rank : All
Surface Type : All
Zone : All
Section Category : All
Last Construction Date: All
PCI : All

Summary of Data for the Inspection Schedule Report

Minimum PCI Table

Branch Use	Pavement Rank	Min PCI
APRON	P	55
RUNWAY	P	70
TAXIWAY	P	70

Number of Years between Inspections Table

Rate of Deterioration (pts/yr)	Years between Inspections
> 9	1
6 - 9	1
2 - 5	2
< 2	3

Condition History Report

The Condition History Report helps the user determine the M & R needs of a pavement section by producing a plot of PCI over time for a given section. From this plot, the user can determine the rate of deterioration of the section. The plot shows the PCI at each inspection date and extrapolates a point five years beyond the last inspection date.

The Condition History Report does not utilize either the selection criteria or sort options. You will be asked to enter the Branch and Section numbers corresponding to the section you want to produce the report for.

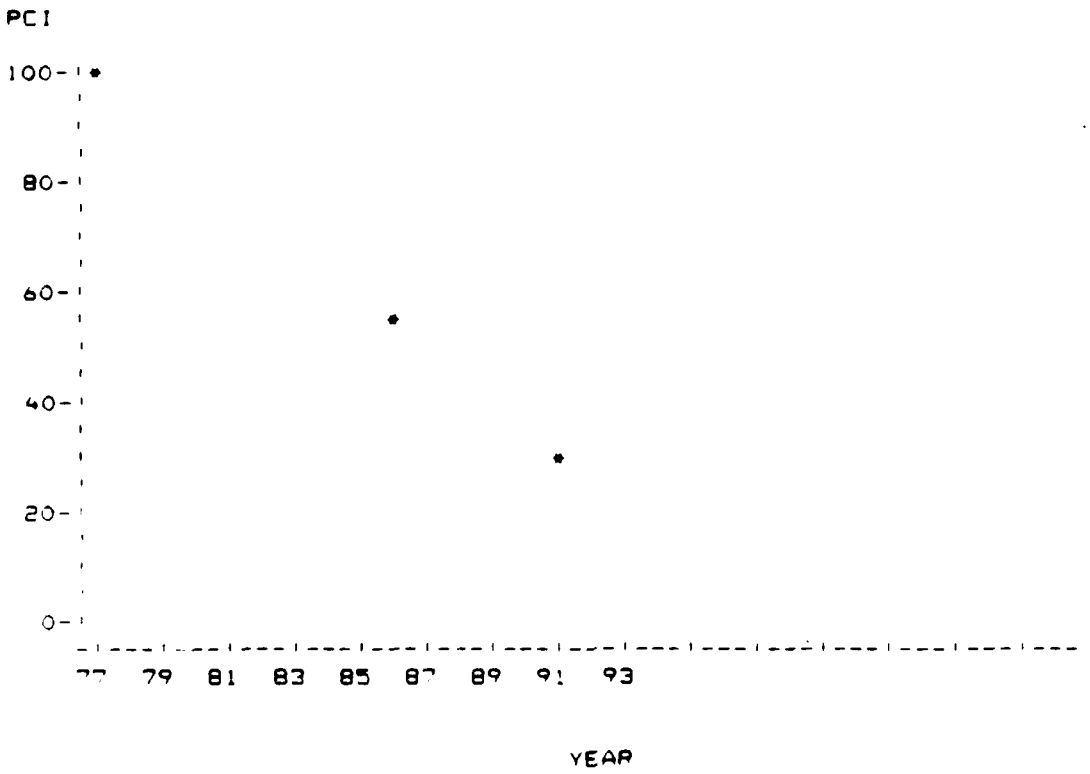
A sample output from the Condition History Report follows:

CONDITION HISTORY

AGENCY NAME: USA-CERL SAMPLE DATABASE
REPORT DATE: OCT/03/1986

BRANCH NAME: RUNWAY 12-30
BRANCH USE: RUNWAY
SECTION NUMBER: A1
PAVEMENT RANK: PRIMARY
SURFACE TYPE: PCC

	DATE	PCI
SU-PC	SEP/30/1976	100
INSPECTION	SEP/30/1985	55
PREDICTION	SEP/01/1990	30



M & R Report

For some sections, routine maintenance such as spall repair, crack filling, etc. may be all that is required. Using maintenance guidelines for specific distress types, the user can input a repair policy. This policy is used in the M & R Report program to estimate the type and cost of routine repair to specific sections. The M & R report can also be used to compute the cost of an overlay after distress repair.

The M & R Report utilizes the maintenance policies developed under the Data Entry and Modification portion of the Micro PAVER program. To use this report, at least one maintenance policy must have been established. Information as to which maintenance policy you want to apply, whether or not you want to overlay a section, and which distresses in the section you want repaired will be required.

The first data which will be requested will be the branch and section number you wish to run the report for. The F1 Help key will list the branch numbers and section numbers stored in your database. To enter the branch number, enter the maximum 5 character alpha-numeric code which represents the particular branch you are interested in. After entering the branch number, enter the maximum 3 character alpha-numeric code which represents the particular section of interest. The results of at least one inspection after the Last Construction Date must be stored for this section for the report to run. You will then be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the Branch/Section Block.

Select: A to Accept the data entered as shown. You will then be prompted to enter data into the Policy Selection block as discussed in the next section.

M to Modify the branch or section number you entered. The previously selected branch/section numbers will be retained until a new one is selected.

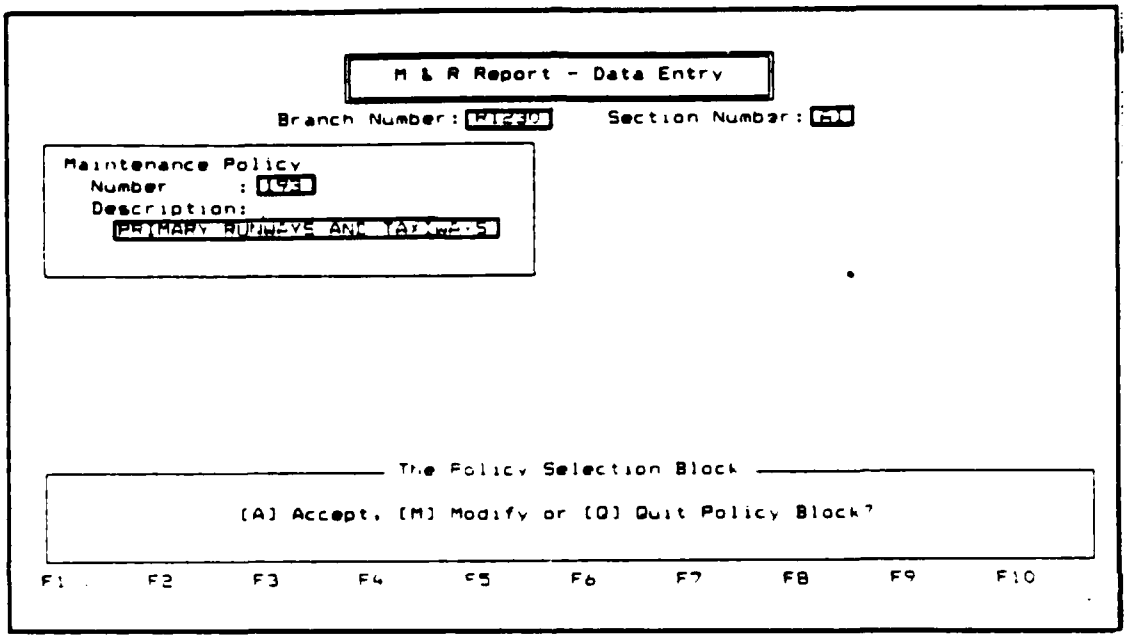
Q is Quit the Branch/Section Block. The branch/section numbers selected will be discarded and you will be taken to the Database Related Reports menu.

Once the Branch/Section Block has been completed, the Maintenance policy number you wish to apply must be entered. Enter the number (maximum of three integers) which defines the policy to be used for the report. Use the F1 Help key to identify the maintenance policies available in your database. After a maintenance policy number has been entered, the maintenance policy description will be displayed and you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the Policy Selection Block.

Select: A to Accept the data entered as shown. You will then be prompted to enter data into the global M & R block as discussed in the next section.

M to Modify the policy number you entered. You will be allowed to select a new policy number. The previously selected policy number will be retained until a new one is selected.

Q to Quit the policy selection block. The policy number selected will be discarded and you will be taken to the Database Related Reports menu.



Once the policy selection block has been completed, the global M & R block will be displayed. You will be asked, "Do you wish to apply an M & R activity across the entire section (Y/N)?"

Enter: N if you do not wish to apply an M & R activity across the entire section. You will be asked if you wish to [A] Accept, [M] Modify, or [Q] Quit the global M & R Block. This will be discussed at the end of the section on answering "yes" to applying a global repair.

Y if you wish to apply an M & R activity across the entire section. You will then be prompted to enter information on the work code. The following guidelines can be used to enter this information.

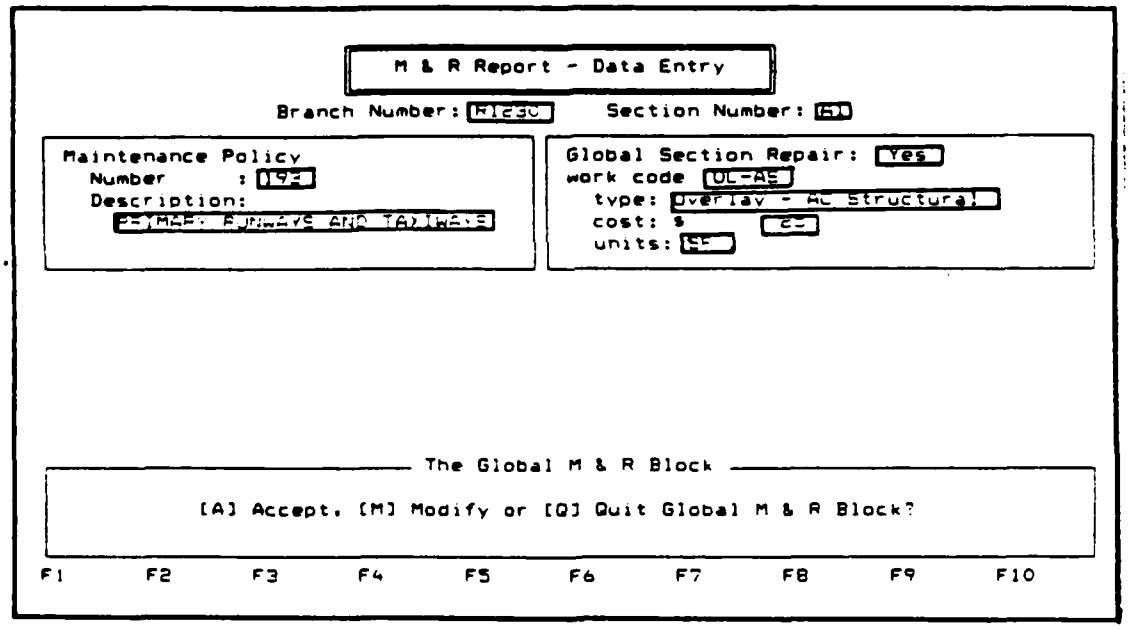
1) Work Code - The work code is made up of a maximum of 5 upper case alpha-numeric characters which represent the activity to be applied to the section. Use the F1 Help key to display the codes and descriptions of the work types available. This table can be updated under the System Utility Option of the main menu. (See Chapter 7). After the work code has been entered, the work type description and the cost associated with that activity will be displayed.

After entering data into the global M & R block, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the Global M & R Block.

Select: **A** to Accept the data entered in the global M & R block as shown You will then be prompted to enter data into the Distress Repair Block as discussed in the next section.

M to Modify the information you entered. You will be returned to the beginning of the Global M & R Block so that any of the information entered can be changed. Values previously entered will be retained until new values are selected.

Q to Quit the Global M & R Block. The information entered will be discarded and you will be taken to the Database Related Reports menu.



The next prompt regards the Distress Repair Block. This block allows you to select which distresses identified in the latest distress survey you wish to repair. The guidelines for using this block vary depending on whether you answered yes or no to the previous question of whether you wanted to apply a global repair to the section.

*If you answered "No" to whether or not you wanted to apply a global repair to the entire section, the following procedures apply:

You will first be asked, "Do you wish to apply the maintenance policy to all distress (Y/N)?"

Enter: **Y** if you want to repair all the distresses identified in the latest condition survey according to the maintenance policy that was selected for this report. The message, "All distress will be repaired" will appear in the block and you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the distress repair block. This will be discussed at the end of this section on the Distress Repair Block.

N if you wish to define which of the distresses that were identified in the latest condition survey you wish to repair. Information from the latest distress survey will appear in the Distress Repair Block as shown below:

Distress Type	Distress Severity	Distress Quantity	Repair
LINEAR CR	Low	250	Yes
LINEAR CR	Medium	4	Yes
JT SEAL DMG	Low	440	Yes

The block displays the distress types, severities and quantities identified in the last condition survey entered in Micro PAVER. It also displays whether or not each distress/severity combination is to be repaired according to the maintenance policy selected for the report. The default value for whether or not a distress type/severity combination will be repaired is yes. To change this, use the scrolling keys (↑ arrow or ↓ arrow) to highlight the distress type/severity combination you wish to edit. Use the F5 Edit key to select whether or not you wish to repair the distress. After entering yes or no, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit that particular distress type/severity combination.

Select: **A** to Accept the answer displayed as to whether that distress should be repaired. You may then edit another distress type/severity combination or use the F10 Exit key if you have finished working on the Distress Repair Block.

M to Modify the answer displayed as to whether that distress should be repaired or not.

Q to Quit. The decision you make as to whether or not that distress should be repaired will be discarded and you may then edit another distress type/severity combination or use the F10 Exit key if you have finished working on the Distress Repair Block.

*If you answered "Yes" to whether or not you wanted to apply an M & R activity to the section, the following procedures apply:

You will first be asked "Do you wish to apply the maintenance policy to the distress before the global repair is done (Y/N)?"

Enter: Y if you wish to repair any of the distresses in the section before the overlay. You will then be asked, "Do you wish to apply the maintenance policy to all distress (Y/N)?" Continue according to the procedures described under the section "If you answered "No" to whether or not you wanted to overlay the section."

N if you do not wish to repair any of the distresses in the section before applying the M & R activity. You will then be asked if you want to [A] Accept, [M] Modify, or [Q] Quit the Distress Repair Block.

When the prompt appears to [A] Accept, [M] Modify, or [Q] Quit the Distress Repair Block, the following guidelines apply:

Select: A to Accept the information shown in the Distress Repair Block. You will then be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the Data Entry Portion of the MRG Report. This is discussed in the next section.

M to Modify the information displayed in the Distress Repair Block. Repeat the procedures previously described.

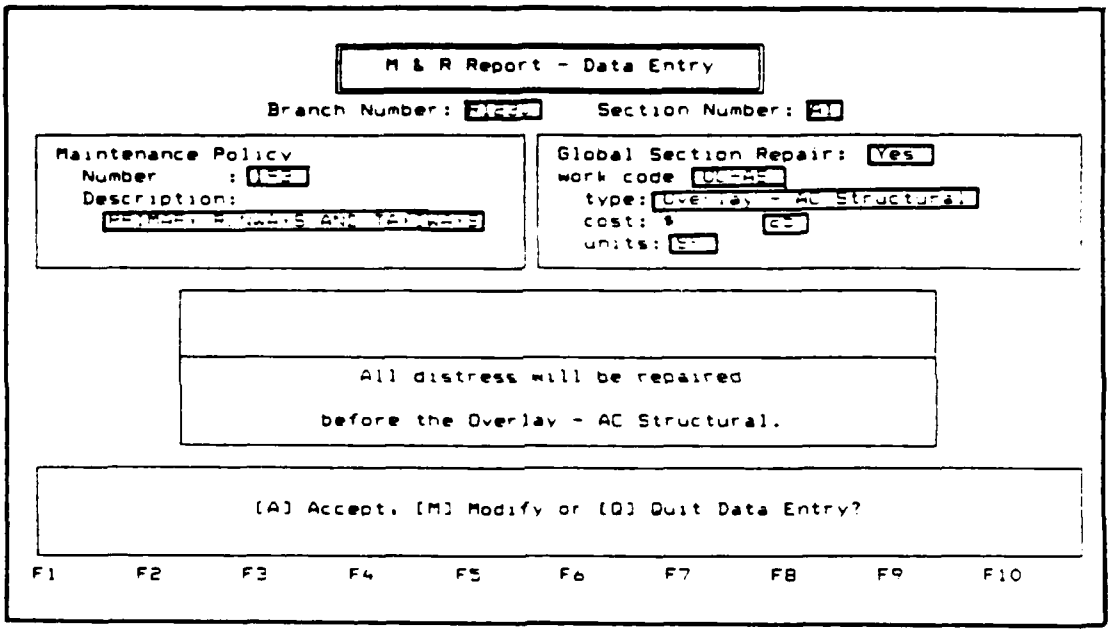
Q to Quit the Distress Repair Block. Your entries will be discarded and you will be taken to the Database Related Reports Menu.

After the Distress Repair block has been completed, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit Data Entry.

Select: A to Accept all the data entered as it appears on your screen. The report will be produced and you will be asked where you want the report sent. Follow instructions at the beginning of the chapter on "Printing a Report".

M to Modify the data appearing on the screen. You will be asked which block you want to modify; the Branch/Section block, Policy Selection block, Global M & R block, or distress Repair block. Select the number on the screen corresponding to the block you wish to modify and follow the instructions for entering data from the previous sections. Your entries will be retained until you change them. Use the F10 Done key after you have completed all modifications.

Q to Quit Data Entry. Your entries will be discarded and you will be returned to the Database Related Report Menu.



A sample output from the M & R report follows:

M & R Report

Agency Name - USA-CERL
Report Date - SEP/25/1986

Branch Name - RUNWAY 12-30
Branch Number - R1230
Section Number - B1

Slab Length - 20.00 LF
Slab Width - 25.00 LF
Number of Slabs - 440

Inspection Date - OCT/22/1982

Section PCI - 83

Distress Type	Dis Sev	Dist-Qty Work-Qty	Work Type	Total Cost $
LINEAR CR	L	250 SLABS 5625 LF	Crack Sealing - PCC	5625
LINEAR CR	M	4 SLABS 90 LF	Crack Sealing - PCC	90
JT SEAL DMG	L	440 SLABS 0 LF	Joint Sealing - Bituminous	0
SMALL PATCH	L	129 SLABS 516 SF	Patching - PCC Partial Depth	3450
SMALL PATCH	M	4 SLABS 16 SF	Patching - PCC Partial Depth	300
LARGE PATCH	L	173 SLABS 21625 SF	Patching - PCC Full Depth	129750
LARGE PATCH	M	17 SLABS 2125 SF	Patching - PCC Full Depth	12750
SHRINKAGE CR		9 SLABS	-- No Maintenance Policy Available -- Overlay - AC Structural	55000
			Total	56348

Network Maintenance Report

Similar to the M & R Report which allows the user to apply a maintenance policy to a particular section, the Network Maintenance Report allows the application of a maintenance policy to all or a portion of the pavement network. This report can be used to estimate the type and cost of routine repair across the entire network.

The Network Maintenance Report utilizes the maintenance policies developed under the Data Entry and Modification portion of the Micro PAVER program. To use this report, at least one maintenance policy must have been established.

The Network Maintenance Report utilizes the selection criteria described earlier in the chapter. The following data elements are included in the selection criteria:

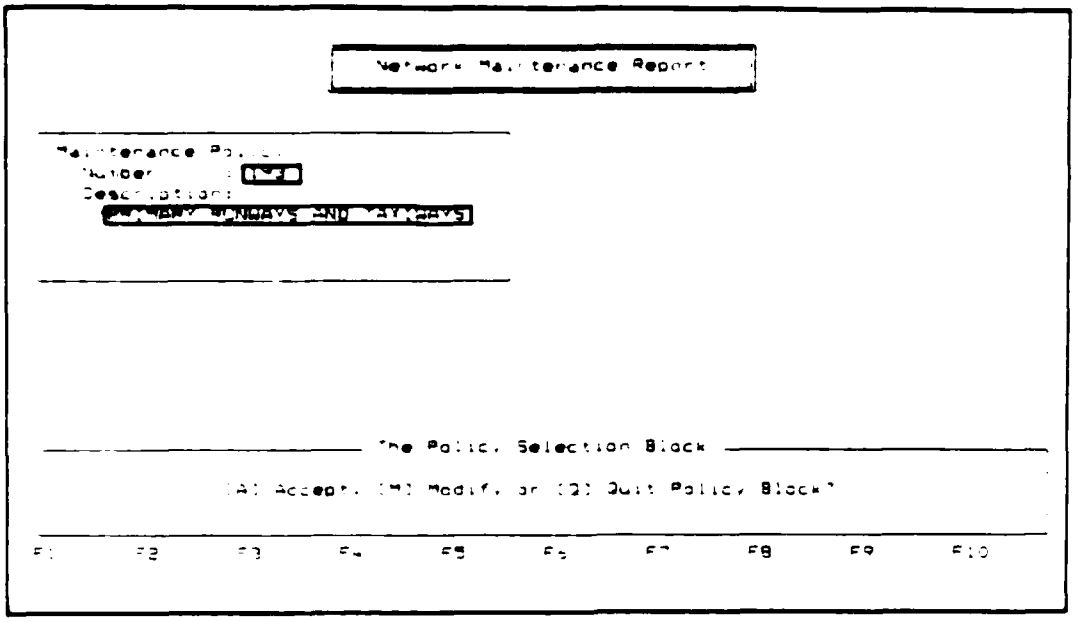
Element	Criteria
Branch Use	All
Pavement Rank	All
Surface Type	All
Zone	All
Section Category	All
Last Construction Date	All
PCI	All

Once the selection criteria have been chosen, you will be asked to enter the Maintenance Policy Number you wish to be applied. Enter the number (maximum of 3 integers) which identifies the policy to be used for the report. Use the F1 Help key to identify the maintenance policies available in your database. After a maintenance policy number has been entered, the maintenance policy description will be displayed and you will be asked to [A] Accept, [M] Modify, or [Q] Quit the Policy Selection Block.

Select: **A** to Accept the data entered as shown. You will then be prompted to select report options as described in the next section.

M to Modify the policy number you entered. You will be allowed to select a new policy number. The previously selected policy number will be retained until a new one is selected.

Q to Quit the Policy Selection Block. The policy number selected will be discarded and you will be taken to the Database Related Reports menu.



Once the Policy Selection Block has been completed, you will be asked to select which report options you would like printed. The following report options are available for the Network Maintenance Report:

* All Options
* Section Detail
* Work Type Summary
* Missing Value List

When the report option block appears on your screen use the scrolling keys (▪ arrow or ▪ arrow) to highlight the report option you desire. Use the F3 Add key to accept that option. An "X" will appear next to the option you have selected. More than one option may be selected by repeating the procedure. The F4 Delete key will delete a choice previously selected. Use the scrolling keys to highlight the report option you want to delete. Use the F10 Exit key after your report options have been selected. You will then be asked to [A] Accept, [M] Modify, or [Q] Quit the report option selection procedure.

Select: **A** to Accept the report options selected as shown. You will then be asked whether you want to accept your data entered. Follow the instructions in the next section.

M to Modify the report options you selected. Previously selected options will be retained until you change them.

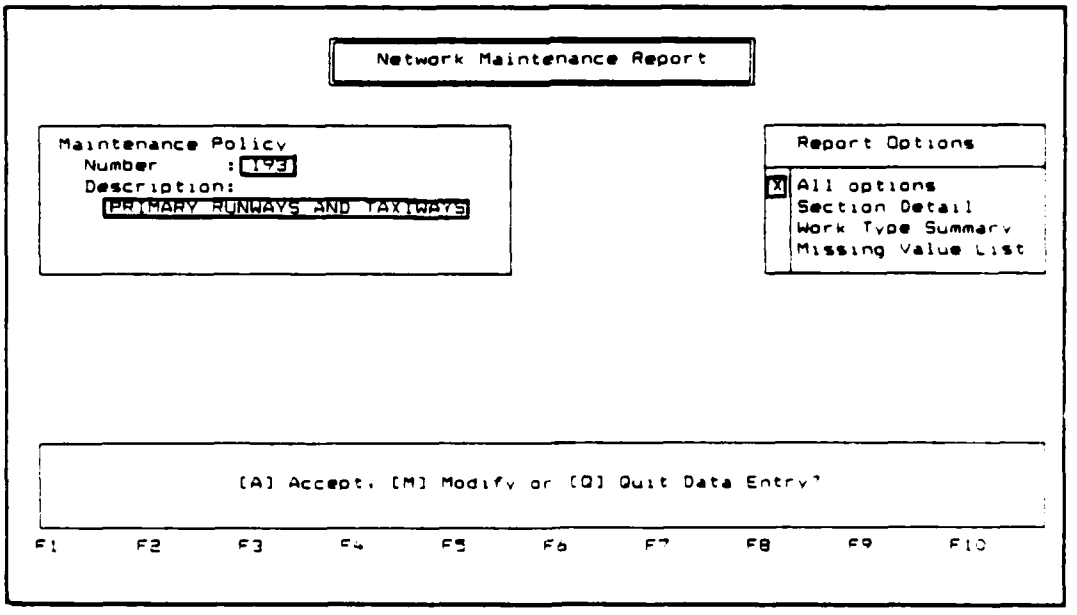
Q to leave the report option block. At least one report option must be selected before Q can be used. You will be taken to the Database Related Reports menu.

After accepting your report options, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit Data Entry.

Select: **A** to Accept the data entered as shown. You will then be asked where you want to send the report. Follow the instructions at the beginning of the chapter on "Printing a Report".

M to Modify data previously entered. You will be asked which block you want to modify - the Policy Selection Block or the Report Option Block. Select the block you wish to modify and follow the procedures discussed previously for entering data.

Q to Quit the data entry portion of the report. Your previously entered data will be deleted and you will be taken to the Database Related Reports menu.



A sample output from the Network Maintenance Report follows.

Network Maintenance Report

Agency Name -
Report Date - OCT/06/1986

Branch Use : All
Pavement Rank : All
Surface Type : All
Zone : All
Section Category : All
Last Construction Date: All
PCI : From 1 To 66

Branch Name - RUNWAY 12-31
Branch Number - R1231
Section Number - A1

Slab Length - 50.00 LF
Slab Width - 25.00 LF
Number of Slabs - 20

Inspection Date - SEP/30/1985

Section PCI - 55

Distress Type	Dis Sev	Dist-Qty Work-Qty	Work Type	Total Cost ($)
63 LINEAR CR	L	2 SLABS		
		75 LF	Crack Sealing - AC	75
63 LINEAR CR	M	4 SLABS		
		150 LF	Crack Sealing - AC	150
65 JT SEAL DMG	H	20 SLABS		
		2000 LF	Joint Sealing - Bituminous	3000
71 FAULTING	L	1 SLABS		
		25 LF	Undersealing - PCC	500
75 CORNER SPALL	M	3 SLABS		
		1 SF	Patching - AC Shallow	7
			Total	3732

Network Maintenance Report

Agency Name -
Report Date - OCT/06/1986

Branch Use : All
Pavement Rank : All
Surface Type : All
Zone : All
Section Category : All
Last Construction Date: All
PCI : From 1 To 66

Branch Name - RUNWAY 12-31
Branch Number - R1231
Section Number - C1

Slab Length - 50.00 LF
Slab Width - 25.00 LF
Number of Slabs - 20

Inspection Date - SEP/30/1984

Section PCI - 65

Distress Type	Dis Sev	Dist-Qty Work-Qty	Work Type	Total Cost ($)
63 LINEAR CR	M	4 SLABS		
		150 LF	Crack Sealing - AC	150
65 JT SEAL DMG	L	20 SLABS		
		2000 LF	Joint Sealing - Bituminous	3000
71 FAULTING	L	1 SLABS		
		25 LF	Undersealing - PCC	500
			Total	3650

Network Maintenance Report

Agency Name -
Report Date - OCT/06/1986

Branch Use : All
Pavement Rank : All
Surface Type : All
Zone : All
Section Category : All
Last Construction Date: All
PCI : From 1 To 66

Work Type Summary Table

Work Type	Branch/ Section		Work-Qty	Cost ($)
Crack Sealing - AC	R1231	A1	225 LF	225
	R1231	C1	150 LF	150
		Total:	375 LF	375
Joint Sealing - Bituminous	R1231	A1	2000 LF	3000
	R1231	C1	2000 LF	3000
		Total:	4000 LF	6000
Undersealing - PCC	R1231	A1	25 LF	500
	R1231	C1	25 LF	500
		Total:	50 LF	1000
Patching - AC Shallow	R1231	A1	1 SF	-
		Total:	1 SF	-

Total cost of all work ($): 7382

Chapter 5

DATA ANALYSIS PROGRAMS

This chapter will explain the generation of reports which do not access information stored in your database, but rather analyze data you enter into the program. The data entry will be discussed and sample outputs will be included. The following programs will be covered:

* Economic Analysis

Data Analysis Programs are accessed by selecting option 3 from the main menu.

Economic Analysis

For any given pavement section, several repair alternatives may be considered feasible. The Economic Analysis report can be used to help select the most appropriate alternative. The user inputs initial costs, periodic maintenance costs, and one-time future maintenance costs. The Economic Analysis Report provides the user with the initial cost and equivalent uniform annual cost per square yard. The program allows the user to vary interest rates, repair costs, and timing so that their effect on alternatives can be analyzed. Information on the algorithms used in this program can be found in Section VII of the Development of a Pavement Maintenance Management System, Vol. III, Engineering and Services Laboratory Technical Report 81-19, or see the PAVER Reference Manual.

The Economic Analysis Program utilizes user-entered data as the basis for determining equivalent uniform annual costs. The user will be asked to identify a section for analysis, identify M & R alternatives and activities that must be performed for that alternative, estimate the life of an alternative, estimate interest and inflation rates, and assign costs, performance years for activities, and if the activities re-occur periodically, time spacings for those activities. The program is accessed by selecting option 1 from the Data Analysis Program Menu.

The following guidelines should be used for entering data:

Section ID: This is a required field. Enter a maximum of 10 alpha-numeric characters which identify the section to be analyzed. Because this program does not access the database, the section ID need not match any identification previously assigned to the section, however using the branch and section numbers as the section ID may be helpful.

Section Area: This is a required field. Enter the area of the section in square yards. A maximum of 10 real numbers may be entered.

After the section identification information has been entered, various M & R alternatives may be considered. Repeat the following procedures for as many alternatives as desired.

M & R Alternative Description:

This is a required field. Enter a maximum of 25 alpha-numeric characters which identify the alternative you wish to investigate. Spaces are allowed between words. Later on in the program you will be asked to identify all the activities associated with this alternative.

Analysis:

This is a required field. Enter the 4 integers which identify the year in which the economic analysis is to begin.

Life of Alternative:

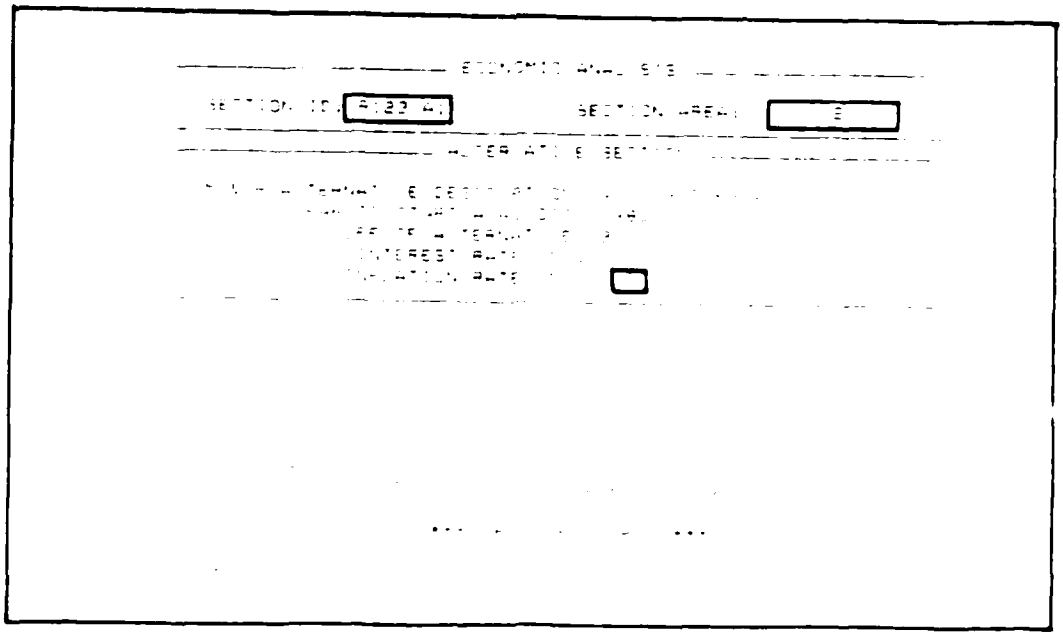
This is a required field. Enter your estimate of the life of the alternative you are investigating. The life must be entered in integer format with a maximum possible life of 99 years.

Interest Rate (%):

This is a required field. Enter a maximum of 3 integers which represent the interest rate in percent. A maximum rate of 100% is allowed.

Inflation Rate (%):

This is a required field. Enter a maximum of 3 integers which represent the inflation rate in percent. A maximum rate of 100% is allowed.



M & R Activity:

Enter the description of the activity associated with the alternative. You may enter a maximum of 20 alpha-numeric characters. Use the F10 Done key when all activities associated with the alternative are complete. You may then select your report options as discussed in the next section.

Year:

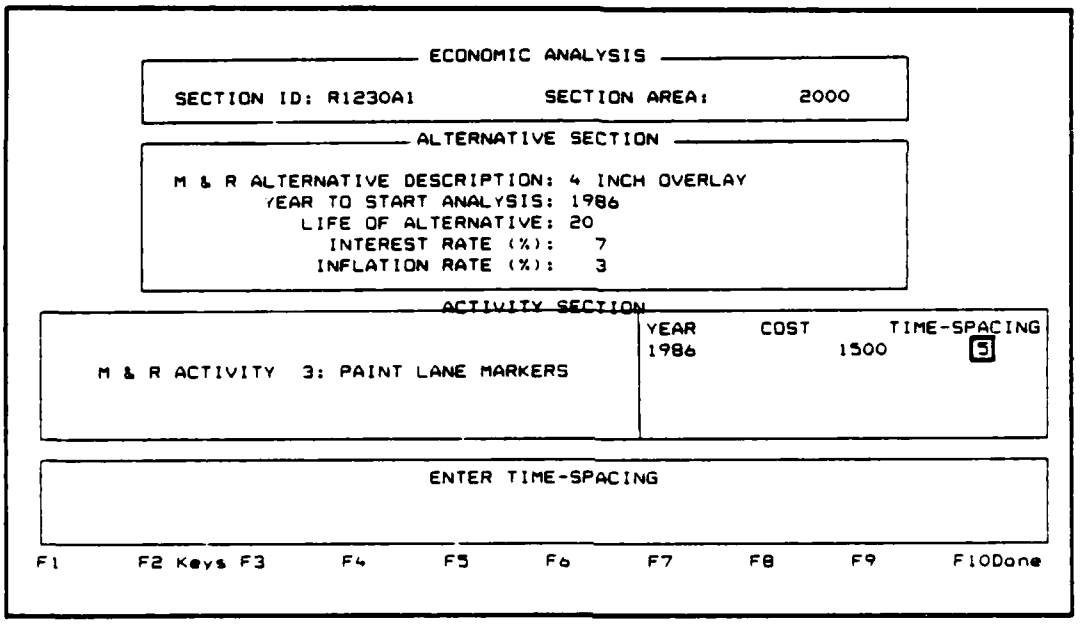
Enter the 4 integers which identify the first year in which the activity is to be performed.

Cost:

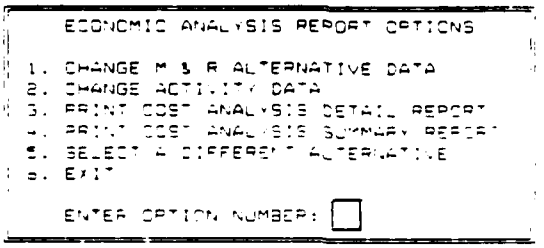
This is a required field. Enter a maximum of 13 real numbers which represent the cost of the activity. All costs should be in present dollars. If the costs will change with time or if the time-spacing of the activity is not periodic, enter an additional year and cost.

Time-Spacing:

This is a required field. Enter a maximum of 2 integers which represent the number of years between applications of the activity if the activity recurs periodically. If the activity occurs only once, or if costs will change with time, enter a 0. You will then be asked to enter the next year-cost-time-spacing for the activity. You may repeat the activity year-cost-time spacing procedures for as many applications as are necessary for the activity. Use the F10 Done key when all year-cost-time spacings have been defined. You may then enter another activity which is associated with the M & R alternative.



When all activities have been identified, use the F10 Done key. You will then be presented with the Economic Analysis Report Options.



The following guidelines can be used to help you select the option you desire:

Select:

Option 1: To change the M & R Alternative Data previously entered. This This allows you to change the M & R Alternative Description Year to Start Analysis, Life of Alternative, Interest Rate or Inflation Rate. Use the carriage return to position the highlighted box to the item you wish to change and enter the new value. Your previously entered values will be retained until you change them. Use the F10 Done key after completing the changes to the M & R Alternative Data.

Option 2: To change the M & R Activity Data previously entered. This allows you to add data previously not entered, or change existing data. Use the scrolling keys (↑ or ↓ arrow) to position the highlighted box over the activity you wish to modify. Select an action by using the function keys. Use the F3 Add key to add a new M & R activity description, year, cost, and time-spacing to your M & R Alternative. Use the F4 Delete key to delete the activity description, year, cost and time-spacing for the highlighted activity. Use the F5 Edit key to modify the description, year, cost, or time-spacing for an existing M & R activity. Use the carriage or tab key return to toggle between elements. Use the F10 Done key when finished.

Option 3: To print the Cost Analysis Detail Report. You will be asked where you want to send the report. See the section at the beginning of Chapter 4 on "Printing a Report".

Option 4: To print the Cost Analysis Summary Report. You will be asked where you want to send the report. See the section at the beginning of Chapter 4 on "Printing A Report".

Option 5: To select a Different Alternative. This allows you to start over again at the beginning of the report and enter a new M & R Alternative and the activities associated with it. Your previously defined alternatives will be discarded.

Option 6: To Exit the Economic Analysis. Your data will be discarded and you will be returned to the Data Analysis Programs menu.

An example of the Economic Analysis Report follows:

DATE:= OCT/10/1986 PROJECTED COST ANALYSIS (DETAIL)

SECTION ID:=R1230A1
ALTERNATIVE:= 4 INCH OVERLAY SECTION AREA(S.Y.):= 2000.0
LIFE OF ALTERNATIVE:= 20 INTEREST RATE:= 7.0 INFLATION RATE:= 3.0

M&R ACTIVITY	YEAR	COST($)	PRESENT VALUE($)
FILL MINOR CRACKS	1986	2000.00	2000.00
PLACE OVERLAY	1986	53000.00	53000.00
PAINT LANE MARKERS	1986	1500.00	1500.00
ANNUAL TOTAL:=		56500.00	56500.00
FILL MINOR CRACKS	1989	2000.00	1783.98
PAINT LANE MARKERS	1991	1500.00	1239.82
FILL MINOR CRACKS	1992	2000.00	1591.29
FILL MINOR CRACKS	1995	2000.00	1419.42
PAINT LANE MARKERS	1996	1500.00	1024.77
FILL MAJOR CRACKS	1996	2500.00	1707.95
ANNUAL TOTAL:=		4000.00	2732.71
FILL MAJOR CRACKS	1997	2500.00	1644.10
FILL MINOR CRACKS	1998	2000.00	1266.11
FILL MAJOR CRACKS	1998	2500.00	1582.64
ANNUAL TOTAL:=		4500.00	2848.74
FILL MAJOR CRACKS	1999	2500.00	1523.47
FILL MAJOR CRACKS	2000	2500.00	1466.52
FILL MINOR CRACKS	2001	2000.00	1129.36
PAINT LANE MARKERS	2001	1500.00	847.02
FILL MAJOR CRACKS	2001	2500.00	1411.70
ANNUAL TOTAL:=		6000.00	3388.07
FILL MAJOR CRACKS	2002	2500.00	1358.92
FILL MAJOR CRACKS	2003	2500.00	1308.12
FILL MINOR CRACKS	2004	2000.00	1007.38
FILL MAJOR CRACKS	2004	2500.00	1259.22
ANNUAL TOTAL:=		4500.00	2266.60
FILL MAJOR CRACKS	2005	2500.00	1212.15

INITIAL COST($):= 56500.00
PRESENT VALUE($):= 82283.91
EQUIVALENT UNIFORM ANNUAL COST($):= 7767.02
EUAC PER SQ. YD. ($):= 3.88

Chapter 6

DATABASE ADMINISTRATION

This chapter will explain the administrative manipulation of your database. The following procedures will be covered.

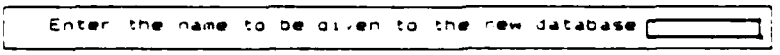
* Create a New Database
* Select a Different Database
* Copy a Database
* Delete a Database
* List Database(s) on a Disk Drive
* Reorganize/Pack Current Database

Database Administration is accessed by selecting option 4 from the main menu.

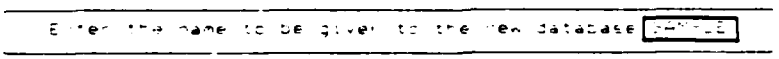
Create a New Database

Before you can enter data into Micro PAVER, you must create a database for storage of your information. The purpose of the database is to provide a method for storing and retrieving data in a logical fashion.

1. To create your database, select option 1, Create a New Database, from the Database Manager Menu. The following prompt will appear at the bottom of your screen:



2. Enter a maximum of 7 alpha-numeric characters which will be used to identify your database.



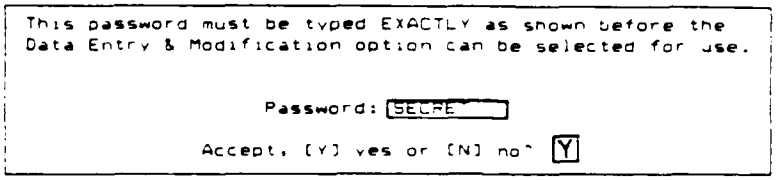
3. You will now have the option of setting a password for the database. By entering a password, access to your database will be restricted. Each time the database is accessed, the password must be entered exactly as it is entered the first time.

If you do not wish to set a password, enter only a carriage return or tab key. This will take you to the site information table described in step 4 of this section.

If you wish to set a password, enter a maximum of 8 alpha-numeric characters. You will then be asked whether you want to "Accept this as the password? (Yes or No)".

Enter: **Y** if you want to accept the password. The message "PASSWORD ACCEPTED" will appear on your screen. You will then be taken to the site information table as described in the next step.

N if you do not want to accept the password. No password will be set for the database and you will be taken to that site information table as described in the next step.



4. The site information table allows you the option of entering information about the database. If you choose not to enter this information at this time, continue to hit the carriage return or use the F10 Done key or tab key until you have moved through the entire table. Your newly created database will be brought online and you may select another database administration option.

If you want to enter site information, the following formats must be followed:

a) Agency - The agency name is the name of the agency managing the pavements. The name may be up to 61 alpha-numeric characters.

b) Security - Any notes pertaining to the security placed on this database may be entered here. This may mean indicating that no security has been set or that a password is required. The description may be up to 23 alpha-numeric characters.

c) Unit of Management - Select whether your data will be entered in English or Metric units. The default selection is English. Enter E for English or M for Metric.

d) Name - Enter the name of a point of contact for questions concerning this database. The name may be up to 25 alpha-numeric characters.

e) Phone - Enter the phone number for the point of contact. You may enter up to 21 alpha-numeric characters.

f) Address - Enter the address for the point of contact. You may enter up to 52 alpha-numeric characters.

g) City, State - Enter the city and state for the point of contact. contact. You may enter up to 30 alpha-numeric characters.

h) Zip - Enter the zip code for the point of contact you may enter up to 10 alpha-numeric characters.

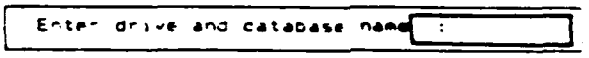
After entering site information, your database will be brought online and you may select another database administration option.

Agency	USA-CERL SAMPLE DATABASE		
Security	PASSWORD REQUIRED	Unit of Measurement	English
Point of Contact	Name: KATIE CATION/ EM DIVISION Phone: 217-373-6774 Address: P.O. BOX 4005 City,State: CHAMPAIGN, ILLINOIS Zip: 61820		

Selecting a Different Database

In order to enter or modify data, the database containing that information must be brought online. The database currently online is displayed in the upper left-hand box of your screen.

1. To bring a different database online, select option 2, Select a Different Database, from the Database Manager Menu. The following prompt will appear at the bottom of your screen.

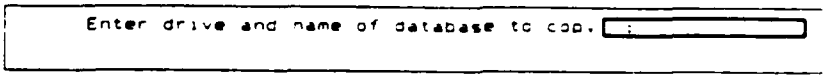


2. Enter the letter which identifies the drive where the database is stored and the maximum 7 character name of the database. The database will be loaded and will appear in the upper left-hand box of your screen.

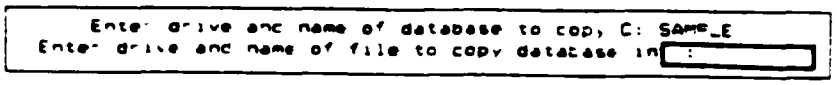
Copy a Database

This option allows you to copy the data stored in a database to a file.

1. To copy a database, select option 3, Copy a Database, from the Database Manager Menu. The following prompt will appear on your screen:



2. Enter the letter which identifies the drive where the database is stored and the maximum 7 character name of the database. The database being copied does not have to be the database currently online. The following prompt will then appear on your screen:

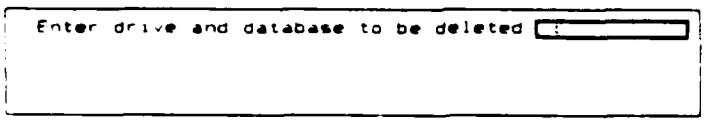


3. Enter the letter which identifies the drive where the file is that you want to copy the database to, and the maximum 7 character name of the file. The file that the database is being copied to does not have to have been previously defined. The database will be copied into the file and you may select another database manager option.

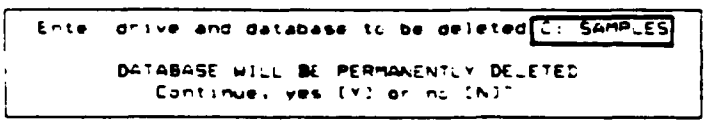
Delete a Database

This option allows you to delete a database from memory. All information stored in the database will be destroyed.

1. To delete a database, select option 4, Delete a Database, from the Database Manager Menu. The following prompt will appear on your screen:



2. Enter the letter which identifies the drive where the database is stored and the maximum 7 character name of the database. The following prompt will then appear on your screen:



3. Enter: **Y** if you want to permanently delete this database. All information pertaining to the database will be destroyed. You may then select another database manager option.

N if you do not want to permanently delete the database. The delete command will be ignored and you may then select another database manager option.

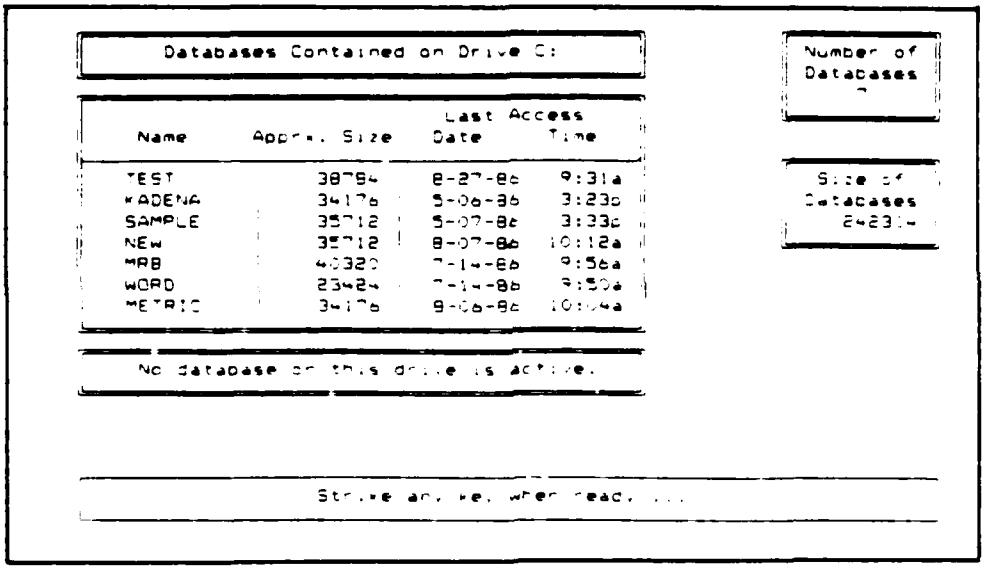
List Database(s) on a Disk Drive

This option allows you to list the databases which are stored on the your drives.

1. To list the databases stored on a particular disk drive, select option 5, List Database(s) on a Disk Drive, from the Database Manager Menu. The following prompt will appear on your screen:

```
Enter drive of directory listing: □
```

2. Enter the letter identifying which drive's databases you would like to see listed. The name, size and last access to the databases will be displayed along with the total size of all the databases stored on that drive. Strike any key when finished with the list. You may then select another database manager option.



Reorganizing/Pack Current Database

This option allows you to reorganize or pack the database which is currently online. This will delete gaps in storage within the database and help eliminate wasted storage space.

To use this option, be sure the database you want to reorganize or pack is displayed in the upper left-hand box as the database online. If not, use option 2, Select a Different Database, to bring a different database online.

Once your database is online, select option 6, Reorganize/Pack Current Database, from the Database Manger Menu. Your database will be reorganized or packed and you may then select another database manager menu.

Chapter 7

SYSTEM UTILITY

This chapter will explain the system utility feature of the Micro PAVER program. The system utility functions are not database dependent. They are agency dependent. The information stored in the system utility option will be applied to all databases within the agency. The following features will be covered:

* Work Type Editor

* Material Code Editor

System Utility is accessed by selecting option 5 from the main menu.

Work Type Editor

The Work Type Editor allows you to add, edit, or delete items from the Work Type Table utilized in the Work History and Maintenance Policy programs. This table contains a representative listing of Construction and Maintenance Activities, Descriptions, Work Units and Unit Costs for each of these activities. The Work Type Editor allows you the option of editing unit costs for system work types or to add/delete/edit user defined activities. The Work Type Editor can be accessed by selecting option 1 from the System Utility menu.

After accessing the Work Type Editor, the Work Type Table will appear on your screen. The first table which appears contains the construction activities. Use the F9 Next key to switch between the construction activities table and the maintenance activities table. Use the PgUp and PgDn keys to move within pages of the construction activities table or maintenance activities table. An asterick (*) in the column labeled "C" indicates that the Last Construction Date is affected by the Work Type.

Code	Description	Work Unit	Unit Cost	C
BA-AG	Base Course - Aggregate	sq. ft.	.00	
BA-BI	Base Course - Bituminous	sq. ft.	.00	
BA-ST	Base Course - Stabilized (non-Bi.)	sq. ft.	.00	
BI-BI	Binder - Bituminous	sq. ft.	.00	
BR-SE	Break & Seat	sq. ft.	.00	
CO-PR	Coat - Prime	sq. ft.	.00	
CO-TA	Coat - Tack	sq. ft.	.00	
CR-PC	Complete Reconstruction - PCC	sq. ft.	.00	*
NC-AC	New Construction - AC	sq. ft.	.00	*
NC-PC	New Construction - PCC	sq. ft.	.00	*
SB-AC	Subbase - Aggregate	sq. ft.	.00	
SB-BI	Subbase - Bituminous	sq. ft.	.00	
SB-ST	Subbase - Stabilized (non-Bitum.)	sq. ft.	.00	
SG-CO	Subgrade - Compacted	sq. ft.	.00	

Construction Activities

Adding Work Types

To add a user defined work type to the table, use the F3 Add key. You will be prompted to enter a Work Type code, description, unit, and cost. You must also determine whether the activity will change the Last Construction Date of the section. The Last Construction Date is affected by any major type of M & R work which brings the PCI up to 100. Use the following guidelines for entering data:

Work Type Code: Enter a maximum of 5 alpha-numeric characters which will be used as the code for the work activity. System work type codes are generally represented as the first two letters of the first word in the description, a hyphen, and the first two letters of the second word in the description.

Description: Enter a maximum of 35 alpha-numeric characters which describe the work type activity.

Work Unit: Prior to entering a work unit, a table will appear with your options for work units. This table may not be modified.

Length	Area
ft.	sq. ft. sq. yd.

Use the scrolling keys (↑ or ↓ arrow) to position the highlighted box over the desired unit of measure. Use the F3 Add key to add this measurement unit to the work unit description box.

Unit Cost: Enter a maximum of 8 real numbers to represent the cost associated with one unit of the work type. Decimals are allowed.

You will then be asked whether this work type will affect the Last Construction Date. If the work type you entered can be considered a major M & R work type which will bring the PCI back up to 100, answer yes to the question. Answering yes may affect the Last Inspection Date and the Last PCI stored in your database when this work type is applied to a section. Answering no indicates that this activity may not necessarily bring the PCI back up to 100.

You must then determine whether this is a Construction or Maintenance Activity. Construction activities are generally associated with new construction. Maintenance activities are applied as a means of

maintaining or repairing existing pavements. Enter a "C" or an "M" as appropriate.

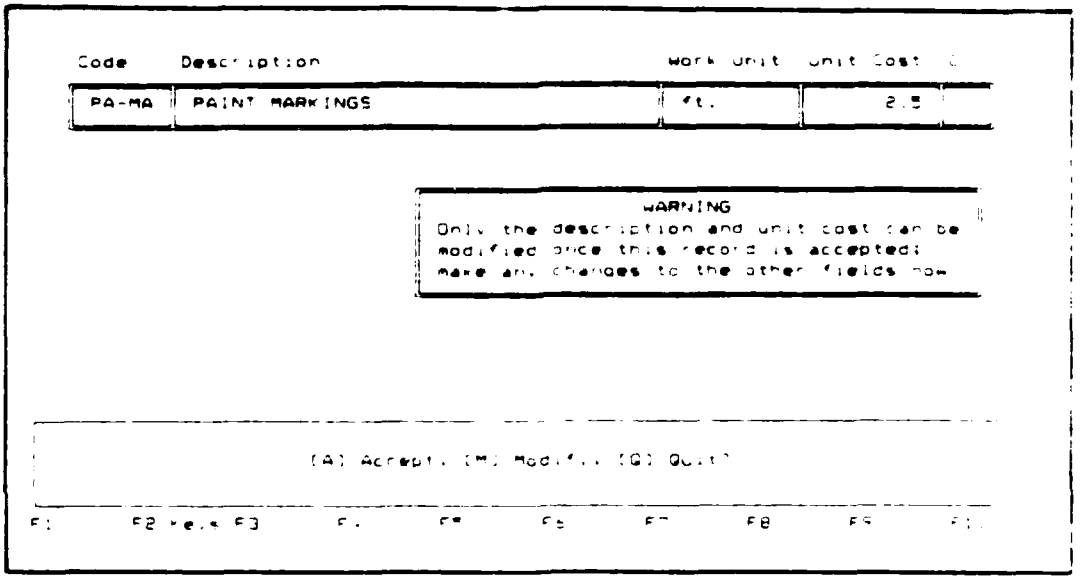
If M is selected, you will then be asked whether this is a global or local maintenance activity. Global activities are generally applied over the entire section. Localized activities are applied to a limited area. Select G for global or L for local.

You will now be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit the new work type activity.

Select: **A** to Accept the new activity as shown. **Note:** Only the description and unit cost can be changed once this record is accepted, so make any changes to other fields now. Your new activity will be added to the appropriate table and you may then enter another new activity or use the F10 Done key to return to the Main Work Type Table.

M to Modify any of the information entered. Position the highlighted box over the field you wish to modify and make your changes according to the guidelines previously discussed. Your entries will be retained until you change them.

Q to Quit the entering of the new work type activity. Your new activity will be discarded and you will be taken back to the Main Work Type Table.



Deleting Work Types

System Work Types (those work types entered by the Micro PAVER developers) can not be deleted. Only user defined work types which have not been used in a Work History record or Maintenance Policy can be deleted.

To delete a work type, position the highlighted box over the work type no longer desired. Use the F4 Delete key to delete the activity. You will be asked if you are sure you want to delete this activity.

Select: Y if you want this record deleted. It will be deleted and you be returned to the Main Work Type Table.

N if you do not want the record deleted. The activity will be returned to the Main Work Type Table.

Editing Work Types

Only the unit cost of system work types (those work types entered by the Micro PAVER developers) can be modified. Only the description and unit cost of user defined work types can be modified.

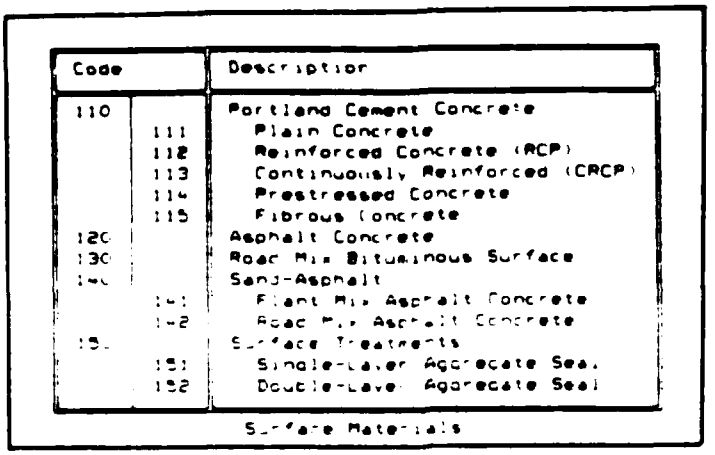
To modify an activity, position the highlighted box over the activity you want to edit. Use the F5 Edit key to begin the process. Edit the fields according to the guidelines described in "Adding Work Types". Use the F10 Done key when you have completed modifying that particular work type. Your modifications will be made and you will be returned to the Main Work Type Table.

Material Code Editor

The Material Code Editor allows you to add, to edit, or delete items from the Material Type Table utilized in the Work History and Maintenance and Repair Guidelines programs. This table contains a representative list of Surface Materials, Treated or Stabilized Materials, and Untreated Materials used for both construction and M & R activities.

System Material Codes (those material codes entered by the Micro PAVER developers) can not be modified or deleted. New material codes can be added, modified, or deleted.

The Material Code Editor is accessed by selecting option 2 from the System Utility Menu. Once accessed, the Material Type Table will appear on your screen. Use the F9 Next key to toggle between the Surface Material, Treated Materials, or Untreated Materials Tables. Use the PgUp and PgDn keys to move within pages of each of the 3 tables.



Adding Material Types

To add a user defined material type to the table, use the F3 Add key. You will be prompted to enter a material code and description. Use the following guidelines to enter data:

Code: Enter a maximum of 3 integers between 100 and 399, which identifies the material type being added. Numbers in the 100 level are used for surface materials, 200 level for treated or stabilized materials, and 300 for untreated materials. Previously defined material codes may not be repeated.

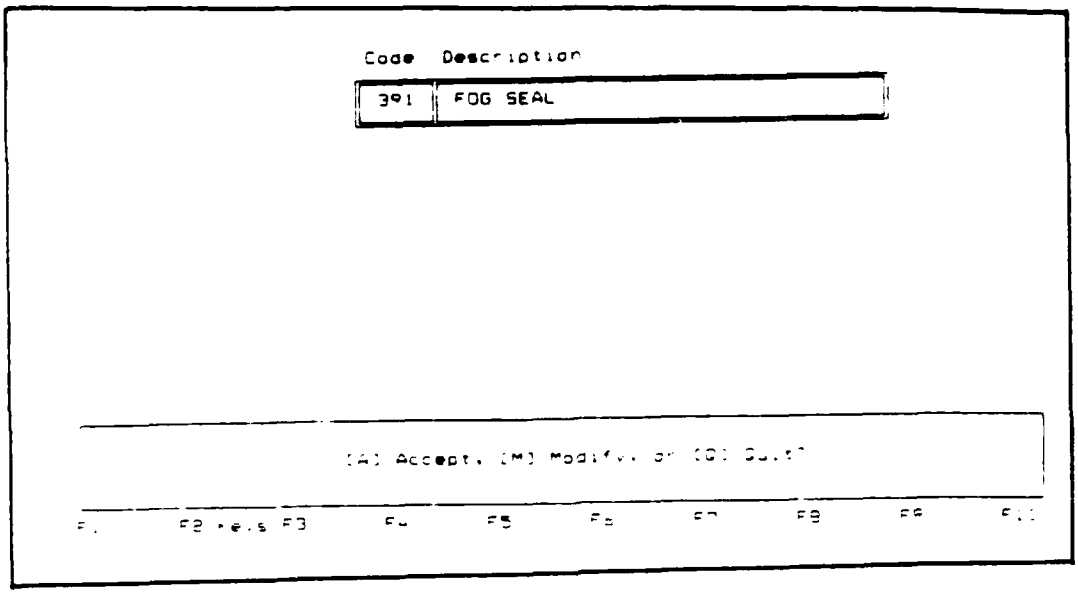
Description: Enter a maximum of 30 alpha-numeric characters which describes the material type. When finished, use the F10 Done key or Return key.

After entering the new material type, you will be asked whether you want to [A] Accept, [M] Modify, or [Q] Quit.

Select: **A** to Accept the new material code and description as shown. The new material type will be added to the table and you may then enter another new material code or use the F10 Done key if you are finished. You will be returned to the main Material Code Editor.

M to Modify any of the information entered. Position the highlighted box over the field you wish to modify, and make changes according to the guidelines previously discussed. Your entries will be retained until you change them.

Q to Quit entering the new Material Code. Your material code will be discarded and you will be taken back to the main Material Code Editor.



Deleting Material Types

System Material Codes (material codes entered by the Micro PAVER developers) may not be deleted. Only user defined material codes which have not been used in a Work History record or M & R report can be deleted.

To delete a work type, position the highlighted box over the material code no longer desired. Use the F4 Delete key to delete the material type. You will be asked if you're sure you want to delete the record.

Select: **Y** if you want the record deleted. It will be deleted and you will be returned to the main Material Code Table.

N if you do not want the record deleted. The material type will be retained and you will be returned to the main Material Code Table.

Editing Material Types

Only user defined material type descriptions can be modified. To modify a material description, position the highlighted box over the material type you want to edit. Use the F5 Edit key to begin the process. Edit the description according to the guidelines discussed under "Adding Material Types". Use the F10 Done key when you have finished. Your modifications will be made and you will be returned to the main Material Code Table.

Chapter 8

FIELD INSPECTION PROGRAM

A field inspection program for the Radio Shack TRS-80® Model 100 portable computer is available with your Micro PAVER programs. This program can be stored on the TRS-80 and used on an inspection as an alternative to recording distresses on paper. This program allows the direct entry of PCI field inspection information which can then be transferred directly to update your Micro PAVER database.

Use of the Micro PAVER field inspection program consists of four distinct steps; downloading the field inspection program to your TRS-80, performing the PCI field inspection, uploading the inspection results to a file on your personal computer, and batch loading of the file to your Micro PAVER database. The first three steps will be covered in detail in this chapter. The batch loading of the file to your Micro PAVER database is covered in Chapter 3, Data Entry and Modification, under the section entitled "Inspection Data - Batch".

Downloading the Field Inspection Program

The downloading of a file from your personal computer to your TRS-80 requires the use of a standard RS-232 communications cable and a "null modem" cable (which you can combine into one cable) to connect between the RS-232 connector on the back of the TRS-80 and an RS-232 port on your personal computer. If you have a non-standard 9-pin connector on the back of your personal computer, you will also need a 25-pin to 9-pin adapter cable. If you use a separate null modem cable, it must be attached in series between the PC and the RS-232 cable. Be sure all necessary connections are made before beginning the download procedure.

Before beginning the download procedure, you must check to be sure that your file is stored on your personal computer in ASCII format and not BASIC format. To check this, access your PAVER directory and type in the following commands:

```
C:\
>cd paver

C:\PAVER
>type field2.bas
```

If you can read the contents of the file, it is in the ASCII format required and is ready to be downloaded. If not, you must change the format. On most machines, this can be done by using the following commands:

```
C:\PAVER
>cd\dos

C:\DOS
>basica
```

You should now be in the BASIC program. Use the F3 Load key to load the field2 file and save it in a new format. Do this by using the following commands:

```
Press the F3 Load key

Load"C:\paver\field2"
Ok

Press the F4 Save key

SAVE "C:\paver\field2",a
OK
System

C:\DOS

>CD\paver
```

Check to be sure that it is in the right format by typing the following command:

```
C:\PAVER

>type field2.bas
```

If the contents of the file are readable, it is in the proper format. If these commands do not work, refer to your DOS manual to change a file from BASIC format to ASCII format.

You are now ready to prepare your TRS-80 for downloading. Turn the TRS-80 on using the switch on the righthand side. The dial on the righthand side can be used to adjust the visibility of the screen according to the angle at which you are viewing. The initial display on the screen is a menu. Options are selected by positioning the dark box over the file (or program) you want using the arrow keys in the upper righthand corner and then pressing the ENTER key.

To prepare your TRS-80 for receiving the file, position the dark box over the TELCOM file and press ENTER. Check the line at the top of the screen to be sure that it reads as follows:

37 E 1 E, 10 pps

If not, press the F3 key and type in the following:

37 E 1 E, 10

Press the ENTER key to accept your entry. Press the F3 and ENTER key again to verify that the change has been made properly.

Press the F4 Term key to go into Terminal mode. Press the F2 Down key to prepare your TRS-80 for receiving the file. Type in the name of the file to be downloaded. To download the field inspection program, type the following file name:

FIELD2

and press the ENTER key. The word "Down" on the bottom of your screen should now be inversed. The TRS-80 is now ready to receive the file.

Initiate the downloading procedure on your micro computer by typing the following command:

```
C:\PAVER
>FT
```

The following prompt will appear on your screen:

```
Micro PAVER File Transfer Program

(S)END TO TRS-80, (R)ECEIVE FROM TRS-80, (Q)UIT?
```

Select S to begin the file transfer program. You will be prompted to enter your baud rate. Set your baud rate at 300 as shown:

```
(S)END TO TRS-80, (R)ECEIVE FROM TRS-80, (Q)UIT? S
ENTER YOUR BAUD RATE (COMMUNICATION SPEED): 300
```

You will then be asked to enter the file name. Enter the file name FIELD2.BAS. Pressing the Return key will begin the downloading of the file. Be sure your TRS-80 is prepared to receive the file before pressing the Return key.

```
(S)END TO TRS-80, (R)ECEIVE FROM TRS-80, (Q)UIT? S
ENTER YOUR BAUD RATE (COMMUNICATION SPEED): 300
FILE NAME? FIELD.BAS
```

The file being downloaded will be displayed on both the micro and the TRS-80 as it is being transferred. When the download is finished, the message "File Sent" will be displayed on the micro and the initial transfer program prompt will be displayed. Select Q to exit the program. You will be returned to the system prompt.

Terminate the download procedure on the TRS-80 by pressing the F2 Down key. Press the F8 Bye key when you have completed transferring files. You will be asked if you wish to disconnect. Entering "Y" will return you to the Telcom program.

Once the file has been downloaded to the TRS-80, the file needs to be converted back to BASIC format. To do this, press the F8 Menu key to return you back to the main menu. To convert a file back to BASIC, you must select the BASIC option from the menu. Use the arrow keys to position the dark box over BASIC and press the ENTER key. Type in the following commands:

```
Ok
LOAD   "FIELD2"
```

(WAIT message will flash as the program is being loaded)

```
Ok
SAVE   "FIELD2"
Ok
KILL   "FIELD2.DO"
Ok
```

Use the F8 Menu key to return to the main menu. You are now ready to use the field inspection program as discussed in the next section.

Using the Field Inspection Program

Turn the TRS-80 on using the switch on the righthand side. The dial on the right hand side can be used to adjust the visibility of the screen according to the viewing angle.

The initial display on the screen is a menu:

```
SEP 11, 1987          THU  11:39:22          (C) Microsoft)

   BASIC                 TEXT              TELCOM          ADDRSS
   SCHEDL                DATAFL.DO         ADRS.DO         CERL.DO
   SAMP.DO               FIELD2.BA

   Select:                                              11013 Bytes free
```

Options are selected by positioning the dark box over the file desired, using the arrow keys in the upper righthand corner, and then pressing ENTER.

NOTE:
When entering inspection data into the TRS-80, be careful, because the TRS-80 program performs only minimal error checking. Format errors, etc., will not be identified until the inspection data are uploaded into Micro PAVER.

To enter inspection data by running the field entry program, use the arrow keys to position the black selection box over FIELD2.BA and press ENTER. Set the caps lock key on.

```
SEP 11, 1987          Thu 11:39:22           (C) Microsoft)

   BASIC                 TEXT              TELCOM          ADDRSS
   SCHEDL                DATAFL.DO         ADRS.DO         CERL.DO
   SAMP.DO               FIELD2.BA

Select:                                              11013 Bytes free
```

An introductory screen displaying credits will be displayed for a few seconds and will automatically switch to the next screen which begins the data entry process. The prompt will read:

ENTER DATE (MMDDYY) ? [ ]

Enter the month, day, year of the inspection in the format shown:

ENTER DATE (MMDDYY) ? [092186]

Next, the user is requested to enter a branch number:

BRANCH NUMBER ? [ ]

The branch number can be a maximum of five alpha-numeric characters which identify your branch. The branch number must be defined in the Micro PAVER database before the inspection results can be uploaded.

BRANCH NUMBER ? [RI230]

A prompt for section number will appear on your screen:

SECTION NUMBER ? [ ]

Enter a maximum of 3 alpha-numeric characters which identify the section. The section number must be defined in the Micro PAVER database before the inspection results can be uploaded.

SECTION NUMBER ? [01]

Next, the user is prompted for the pavement surface type:

ASPHALT OR CONCRETE (A/C) ? [ ]

By putting an A for asphalt pavements or C for concrete pavements and pressing enter (the caps lock key must be engaged at this point) the pavement surface type is input.

ASPHALT OR CONCRETE (A/C) ? [C]

The user then inputs the total number of sample units in the branch, which can be a number between 1 and 201.

TOTAL # OF SAMPLE UNITS ? ☐☐

The user is provided with a summary of the previously entered information, as shown below and may choose to accept the information entered or start over beginning with branch number.

```
DATE   092186
BRANCH NUMBER   R1230
SECTION NUMBER   01
SURFACE TYPE   C
# OF SAMPLE UNITS  11
IS THIS CORRECT  (Y/N)?
```

If the user inputs N, he is then returned to the part of the data input where branch number is requested as before:

BRANCH NUMBER ? ☐☐☐☐

When reentering BRANCH NUMBER, SELECTION NUMBER, SURFACE TYPE, and TOTAL NUMBER OF SAMPLES, entering an exclamation mark will cause the value of the field to remain unchanged.

Once the user has entered and accepted the pavement identification data, the following prompt is displayed:

HAS A 10 (OR 7) CARD BEEN INPUT FOR THIS DATE (Y/N) ☐

This prompt asks if pavement identification data, including the 6 optional section conditions: RIDING, SAFETY, DRAINAGE, SHOULDERS, OVERALL, and F.O.D. have been generated for the particular inspection date for the specified branch and section. If not, a form is automatically generated, and each condition is prompted for. Entering values for these section conditions is optional. Not entering values will have no effect on your results. This information is not used in calculating the PCI. Enter only a carriage return to skip any of the section conditions. If values are to be entered, the following formats must be adhered to:

RIDING? Enter a maximum of 3 alpha-numeric characters to rate the the overall riding quality of the section. The user may use any rating scale desired.

SAFETY? Enter a maximum of 3 alpha-numeric characters to rate the overall safety condition of a section. The user may use any rating scale desired, i.e., skid number.

DRAINAGE? Enter a maximum of 3 alpha-numeric characters to rate the drainage conditions of a section. The user may use any rating scale desired.

SHOULDERS? Enter a maximum of 3 alpha-numeric characters to rate the condition of the shoulders of the section. The user may use any rating scale desired.

OVERALL? Enter a maximum of 3 alpha-numeric characters to rate the overall condition of the section. The user may use any rating scale desired.

F.O.D. ? Enter a maximum of 3 alpha-numeric characters to rate the foreign object damage potential of the section. The user may use any rating scale desired.

Otherwise, if Y is entered after the card prompt, the user is requested to enter a sample unit number, which may be a maximum of 3 alpha-numeric characters.

SAMPLE UNIT # ? [01]

The user is then prompted for sample unit type. Enter "A" for additional sample units and "R" for random sample units. Upper case letters only are accepted.

SAMPLE TYPE (A/R) ? [R]

The AREA OF SAMPLE UNIT (for asphalt) in square feet (meters) or NUMBER OF SLABS in the sample unit (for concrete) is then requested. A number up to eight digits may be entered:

NUMBER OF SLABS ? [20]

Now a prompt will appear, DC SEV QUAN (for asphalt) or DC SEV SLABS (for concrete). Type in information according to surface type. Valid distress codes for roads and parking areas are 1-19 for asphalt and 21-39 for concrete. Valid distress codes for airfields are 41-56 for asphalt and 61-75 for concrete See Table 1 for a list of the distress codes and their corresponding distress types.

TABLE 1

Pavement Distress Types and Corresponding Codes

AC ROADS and PARKING LOTS

CODE	DISTRESS TYPE
1	ALLIGATOR CRACKING
2	BLEEDING
3	BLOCK CRACKING
4	BUMPS/SAGS
5	CORRUGATION
6	DEPRESSION
7	EDGE CRACKING
8	JOINT REFLECTION CRACKING
9	LANE/SHOULDER DROP
10	LONGITUDINAL/TRANVERSE CRACKING
11	PATCH/UTILITY CUT
12	POLISHED AGGREGATE
13	POTHOLE
14	RAILROAD CROSSING
15	RUTTING
16	SHOVING
17	SLIPPAGE CRACKING
18	SWELL
19	WEATHERING

PCC ROADS and PARKING LOTS

CODE	DISTRESS TYPE
21	BLOW-UP/SHATTER
22	CORNER BREAK
23	DIVIDED SLAB
24	DURABILITY CRACKING
25	FAULTING
26	JOINT SEAL DAMAGE
27	LANE/SHOULDER DROP
28	LINEAR CRACKING
29	LARGE PATCH/UTILITY CUT
30	SMALL PATCH
31	POLISHED AGGREGATE
32	POPOUTS
33	PUMPING
34	PUNCHOUT
35	RAILROAD CROSSING
36	SCALING/CRAZING
37	SHRINKAGE CRACKING
38	CORNER SPALLING
39	JOINT SPALLING

AC AIRFIELDS

CODE	DISTRESS TYPE
41	ALLIGATOR CRACKING
42	BLEEDING
43	BLOCK CRACKING
44	CORRUGATION
45	DEPRESSION
46	JET BLAST
47	JOINT REFLECTION CRACKING
48	LONGITUDINAL/TRANSVERSE CRACKING
49	OIL SPILLAGE
50	PATCHING
51	POLISHED AGGREGATE
52	WEATHERING/RAVELING
53	RUTTING
54	SHOVING
55	SLIPPAGE
56	SWELLING

PCC AIRFIELDS

CODE	DISTRESS TYPE
61	BLOW-UP
62	CORNER BREAK
63	LINEAR CRACKING
64	DURABILITY CRACKING
65	JOINT SEAL DAMAGE
66	SMALL PATCH
67	LARGE PATCH/UTILITY
68	POPOUTS
69	PUMPING
70	SCALING/CRAZING
71	FAULTING
72	SHATTERED SLAB
73	SHRINKAGE CRACKING
74	JOINT SPALLING
75	CORNER

Enter the one or two digit distress code that represents the distress type identified during the survey followed by a space, then the severity (L, M, or H) followed by a space, then the quantity/slabs, numeric up to five digits, all on one line.

DC SEV SLABS ? 21 L 3

The distress values will be accumulated until the user enters: END or ERASE after the DC SEV SLABS (DC SEV QUANTITY) prompt.

If the user wishes to erase the distresses and re-enter them, simply type ERASE. If the user types in END in response to the prompt, it will return to ask for a new SAMPLE UNIT NUMBER. After typing END and pressing ENTER, there will be a slight pause as the TRS-80 stores the distress data. At this point the user may repeat the entry procedure for a new sample unit or enter END to save the input data and signal that no more sample units are to be entered.

SAMPLE UNIT # ? END

The program will return to the very beginning:

BRANCH NUMBER ?

A new BRANCH NUMBER may be entered at this time, any or all values may be retained by typing an exclamation point, or just enter END once more to quit inspection data entry and return to the main MENU.

BRANCH NUMBER ? END
Ok

The information just entered is saved in a file called DATAFL.DO. After running the field entry program, press F8 to return to the menu or type MENU. To look at the file, position the dark box on the name "DATAFL.DO" and press ENTER.

```
Sep 11, 1987          Thu  11:39:22                (C) Microsoft)

    BASIC          TEST              TELCOM                ADDRSS
    SCHEDL         DATAFL.DO         ADRS.DO               CERL.DO
    SAMP.DO        FIELD2.DO

  Select:                                          11013 Bytes free
```

The first few lines of the file will be displayed:

```
100921861  1 A50  50  40 30    40    NON   10

110921861  1 A1   R   2063M           269M
    371H   1

110921861  2 A1   R   1967M           268M
```

Additional lines can be viewed using the up and down arrow keys to scroll through the file. The first line displayed is the 10 (for PCC pavements) or 7 (for AC pavements) card which contains the pavement definition data. The following lines contain the distress data under card 11 headings. They contain the date, branch number, section number, sample unit number, sample type, and the distress types, severity, and quantity. Press F8 to return to the menu.

When FIELD2.BA is run again, any new information will be appended to DATAFL.DO. It is possible to purge this file by returning to the menu, selecting the BASIC option, and pressing ENTER.

```
SEP 11, 1987        Thu  11:39:22        (C)Microsoft)

  BASIC                  TEXT             TELECOM    ADDRSS
  SCHEDL                 DATAFL.DO        ADRS.DO    CERL.DO
  SAMP.DO                FIELD2.BA


    Select:                                11013 Bytes free
```

Typing in: Kill "DATAFL.DO" will completely delete the file.

```
TRS-80 Model 100 Software
Copr. 1983 Microsoft
10829 Bytes free


Ok
Kill  "DATAFL.DO"
```

Press F8 to return to the menu. DATAFL.DO should be gone.



```
SEP 11, 1987        Thu  11:39:22                (C)Microsoft)

  BASIC                   TEXT            TELECOM       ADDRSS
  SCHEDL                                  ADRS.DO       CERL.DO
  SAMP.DO                 FIELD2.BA

  Select:                                    11013 Bytes free
```



Uploading the Field Inspection Results

After the inspection results have been stored on the TRS-80, you are ready to begin the uploading of your data to your personal computer. Before beginning the transfer process, be sure all communication connections are made as described under the section entitled "Downloading the Field Inspection Program".

Be sure you have accessed the PAVER directory before initiating the upload procedure. This was discussed in the first section of this chapter. Initiate the uploading procedure on your micro computer by typing the following command:

```
c:\PAVER

>ft
```

The following prompt will appear on your screen:

```
(S)END TO TRS-80, (R)ECEIVE FROM TRS-80, (Q)UIT?
```

Select R to begin the file transfer program. You will be prompted to enter your baud rate. Select your upload baud rate from the table below for the type of micro computer being used.

	Micro Baud Rate
XT (or compatible)	300 pps
AT (or compatible)	9600 pps

An example of setting the baud rate for an XT equivalent computer is shown below:

```
ENTER YOUR BAUD RATE (COMM SPEED): 9600
```

You will then be asked to enter the file name. Enter the file name under which you want to store the distress information, but DO NOT press RETURN until your TRS-80 has been prepared for uploading.

```
FILE NAME? RI230
```

To prepare your TRS-80 for sending the file, position the dark box over the Telcom file and press ENTER. Check the line at the top of the screen to be sure that it corresponds to the appropriate uploading baud rate for the type of micro computer being used.

	TRS-80 Baud Rate
XT (or compatible)	37E1E, 10pps
AT (or compatible)	87E1E, 10pps

If the baud rate is not set properly, press the F3 Start key and type in the appropriate baud rate without the "pps" at the end. Press the ENTER key to accept your entry. Press the F3 Stat key and ENTER again to confirm that the appropriate rate was set.

Once the baud rate is set, press the F4 Term key to go into Terminal mode. Press the F3 Up key to begin the upload procedure. You will be prompted to type in the name of the field to be uploaded. Information entered in the field inspection program is automatically stored under the file name DATAFL.DO. Enter that file name at the prompt and press ENTER.

File to Upload? DATAFL.DO

You will then be prompted to enter the width of your file. Enter the number 80 in response to this prompt, but DO NOT press ENTER.

Width: 80

Both machines are now set to upload the file. Press ENTER on the Micro computer first then on the TRS-80.

The file being transferred will be displayed on your micro computer as it is being received. The message "File Received" will appear after the entire file has been sent. The initial transfer program prompt will be displayed. Select Q to exit the program. You will be returned to the system prompt. Instructions on the batch entry of this file to your Micro PAVER database is discussed in Chapter 3 under the section entitled "Inspection Data-Batch". It is crucial that you realize that the upload command does not enter the data into your database. Refer to Chapter 2 for the procedures needed to transfer the data.

Your TRS-80 is automatically returned to terminal mode so you can immediately upload another field if desired. When you have finished uploading files, press the F8 Bye key. You will be asked if you wish to Disconnect. Entering a "Y" will return you to the Telcom program. Press the F8 key to return to the main menu.

Manual Preparation of a File For Batch Loading

In some instances, batch loading of inspection results obtained through a means other than the field inspection program may be desired. This would be the case if inspection results were stored on some other computer, or if it is felt that the quantity of data being entered warrants batch loading. In any case, the file must be prepared in a particular format.

Data is stored in card format. Asphalt concrete pavements use the 07 and 08 cards for entering inspection data, and Portland cement concrete pavements use the 10 and 11 cards. The formats for each of these cards are shown below. Guidance for entering data in each field can be found in this chapter under "Using the Field Inspection Program".

07 (AC) AND 10 (PCC) CARD FORMAT

FIELD NAME	FORMAT	COLUMNS
Form ID	Numeric	1-2
Inspection Date	MMDDYY	3-8
Branch Number	Alpha-Numeric	9-13
Section Number	Alpha-Numeric	14-16
Add/Change/Delete	Alpha-Numeric	17
Riding	Alpha-Numeric	18-20
Safety	Alpha-Numeric	21-23
Drainage	Alpha-Numeric	24-26
Shoulder	Alpha-Numeric	27-29
Overall	Alpha-Numeric	30-32
F.O.D.	Alpha-Numeric	33-35
Total # of Samples in Section	Numeric	36-38

08 (AC) and 11 (PC) CARD FORMAT

FIELD NAME	FORMAT	COLUMNS
Form ID	Numeric	1-2
Inspection Date	MMDDYY	3-8
Branch Number	Alpha-Numeric	9-13
Section Number	Alpha-Numeric	14-16
Add/Change/Delete	Alpha-Numeric	17
Sample Unit Number	Alpha-Numeric	18-20
Sample Type	Alpha-Numeric	21
Area of Sample/ Number of Slabs	Numeric	22-26
Distress Code	Numeric	27-28
Severity	Alpha-Numeric	29
Quantity	Numeric	30-34
Distress Code	Numeric	35-36
Severity	Alpha-Numeric	38-42
Quantity	Numeric	37-42
Distress Code	Numeric	43-44
Severity	Alpha-Numeric	45
Quantity	Numeric	46-50
Distress Code	Numeric	51-52
Severity	Alpha-Numeric	53
Quantity	Numeric	54-58
Distress Code	Numeric	59-60
Severity	Alpha-Numeric	61
Quantity	Numeric	62-66
Distress Code	Numeric	67-68
Severity	Alpha-Numeric	69
Quantity	Numeric	70-74

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